The Mysore Agricultural Journal

(The Organ of the Mysore Agricultural and Experimental Union)

CONTENTS OF Vol. XX

Published—1942

BANGALORE CITY:
PRINTED AT THE BANGALORE PRESS MYSORE ROAD
1942

CONTENTS

Vol. XX

PAGE

No. 1.

Editorial 1

Curiosities in Cocoanuts—
By A. K. Yegnanarayana Iyer, M.A., N.D.D., Dip. in Agri. 2–4

The Cultivation of Small Millets in Mysore State—
By Dr. L. S. Dorasamy, M.Sc. (Lond.), Ph.D. (Lond.) .. 5–9

Cultivation of S. 705 Paddy—
By S. V. Sharma 10

A Brief Note on the Cultivation of Jola (Sorghum) in Mysore—
By T. Srinivasa Murthy, M.Sc. 11–14

A New Hybrid Groundnut—
By K. Gopala Iyengar 15–16

Results from Subvention Farms 17–31

Field Notes (*From the Civil Veterinary Department*) .. 32

What is Showing in the All-India Southern Regional Cattle Show—
Communicated by the Hon. Secretary, All-India Southern Regional Cattle Show 33–38

SELECTIONS—

Agriculture in the Mysore State (1940-41) 39–40

REVIEWS—

Yield, Chemical Composition and Feeding Value for Milk Production of Alfalfa Hay Cut at Three Stages of Maturity.
—*U.S.D.A. Technical Bulletin 739* 41

Vegetable Gardening in Malaya 41–42

List of Publications Received with Contents 43–51

No. 2.

Live Stock of Mysore: Cattle—
By P. MeIsaac, B.Sc. (Hons.), Ph.D. 53–61

Methods for Improving Paddy Production in Mysore—
By S. V. Sharma 62–68

The Agricultural Colony—
By Byatarangappa 69–71

A Brief Note on the Development of the Poultry Section—
By S. B. Vasudeva Rao, L.V.P. (Hons.) 72–73

The Twenty-Second Annual General Meeting and Field Day of The Mysore Agricultural and Experimental Union, Bangalore 74–77

Report of the Secretary, The Mysore Agricultural and Experimental Union, Bangalore 78–81

PAGE

SELECTIONS—

Candling Eggs 82–84
Groundnut in India 84–86
Industrial Uses of Sugarcane Bagasse 86–90
List of Publications Received with Contents 91–106
Index to Subjects 107–108

No. 3.

Suitable Procedures for Laying out Experiments in the Fields of Cultivators—
By T. G. Rama Iyer, B.A. 109–115
Statistics as applied to Agriculture—
By A. Ananthapadmanabha Rao, B.A. 116–121
A Note on the Liver Fluke Disease in the Irwin Canal Area and the Control Measures adopted by the Special Scheme—
By N. S. Krishna Rao, L.V.P. 122-124
Bee-Flora of a Coffee Estate—III—
By R. L. Narasimha Swamy, MSc. 125–127
The Amrit Mahal Cow as a Milk Animal—
By P. McIssac, B.Sc. (Hons.), Ph.D. 128–129

SELECTIONS—

Peanut-Meal in Livestock Production 130–132
How to Control Fleas 133–135
The Biology of the Cattle Tick and Other Species of Tick in Puerto Rico, with Notes on the Effects on Ticks of Arsenical Dips 135–136
List of Publications with Important Contents 137–150

No. 4.

Editorial 151–152
"Grow More Paddy"—
Department of Agriculture—Circular No. 66 153–157
Improvement of *Doddahatti* Cottons in Mysore—
By G. Sreenivasa Iyengar, M.Sc. 158–162
Practical Results of Sugarcane Research in Mysore—
By B. Venkoba Rao, B.Sc. 163–168
Results of Subvention Farms 169–180

SELECTIONS, ABSTRACTS AND EXTRACTS—

Crop Insurance 181–182
Utilisation of Press-Mud, Cane-Trash and Bagasse in the Cane Fields: 1—Composting 182
The Value of Molasses When Making Silage 182–183
Drying Apples 183
Anti-larval Flushing of Rivers and Streams in Ceylon .. 184
An Investigation on the Use of Automatic Siphon Sluices on a Group of Tea Estates in Northern Bengal .. 184–185
List of Publications with Important Contents 186–188

ILLUSTRATIONS

PAGE

Curiosities in Cocoanuts—

A Tree with Two Stems } *facing p.* 2
A Tree with Seven Branches }

A Tree with Shrunken Spindly Lengths of Stem } *facing p.* 3
A Tree with Large Number of Fruits }

Map of the Mysore State showing the Acreage of Jola (1936-37) in the Districts 12

A New Hybrid Groundnut—G. 0173 16

IMP. INST. ENT.
— LIBRARY —
21 JAN. 1946
SERIAL As 6
SEPARATE

EXP

The Mysore Agricultural Journal

(The Organ of the Mysore Agricultural and Experimental Union)

Vol. XX] 1941—42 [No. 1

IN THIS ISSUE

Cultivation of Small Millets in Mysore State.

What is Showing in the All-India Southern Regional Cattle Show at Bangalore.

1941

The

Mysore Chemicals and Fertilisers, Ltd.

(Manufacturing Operations were commenced in May 1940)

REGISTERED OFFICE:

1128, Vanivilas Road, MYSORE

Telegram : "CHEMI" Mysore

Telephone: 243

Works: BELAGULA

(Mysore State Railway)

on the way to Brindavan Gardens

(KRISHNARAJASAGAR)

Telephone: 435

Capital :

Authorised and Issued .. Rs. 25,00,000

(10% of the shares subscribed by Government of Mysore)

Manufacturers of

Sulphuric Acid, Ammonia, Ammonium Sulphate, Superphosphates

Fertiliser Mixtures and other Chemicals

THE MYSORE AGRICULTURAL JOURNAL

A quarterly magazine devoted to the advancement of Agriculture and published by the Mysore Agricultural and Experimental Union

BOARD OF EDITORS

Chief Editor:

M. J. Narasimhan, B.A., Deputy Director of Agriculture

Associate Editors:

M. G. Singarachar, B.A., A.C.E., Agricultural Engineer (*Retd.*)

S. D. Achar, G.B.V.C., P.G. (Punjab), Superintendent, Veterinary Services

T. V. Subramanyam, Dip. in Agri., Entomologist

B. T. Narayanan, B.A., Ph.D., Agricultural Chemist

L. S. Dorasami, M.Sc. (Lond.), Ph.D. (Lond.), Economic Botanist

Rajasevasakta B. Venkatanaranappa, M.A., Professor of Physics (*Retd.*)

B. V. Venkatacharya, B.Sc. (Agri.), Inamdar, Alakere, Mandya District

S. V. Sharma, Senior Assistant Botanist, I./C. Paddy Scheme

K. H. Sreenivasan, M.A., B.Sc. (Edin.), Senior Assistant Director of Agriculture, Bangalore

C. V. Ramiah, Superintendent, The Mysore Tobacco Company, Ltd.

K. M. Guru Raja Rao, L.Ag., Principal, Mysore Agricultural School, Hebbal

M. Vasudevamurthy, B.Ag., Secretary to the Board and Editor, Kannada Edition

Rates of Subscription :—

Free to members of the Union

Rupees 3–5–0 per volume to non-members

Foreign subscription, 5 shillings

Subscription can begin from any number desired

Single copy, annas 14. Foreign, 1*s.* 3*d.*

Inclusive of postage in each case

ADVERTISEMENT TARIFF

	4 Insertions (Consecutive)	Single Insertion
	Rs.	Rs.
I. Fourth Cover Page—		
i. Full Page	.. 60	20
ii. Half Page	.. 35	12
II. Second and Third Cover Pages		
i. Full Page	.. 45	15
ii. Half Page	.. 25	8
iii. One Inch	.. 8	3
iv. Minimum	.. 8	3
III. Text Pages		
i. Full Page	.. 30	10
ii. Half Page	.. 16	6
iii. One Inch	.. 5	2
iv. Minimum	.. 5	2

CONTENTS

PAGE

Editorial 1

Curiosities in Cocoanuts—
By A. K. Yegnanarayana Iyer, M.A., N.D.D., Dip. in Agri. 2

The Cultivation of Small Millets in Mysore State—
By Dr. L. S. Dorasamy, M.Sc. (Lond.), Ph.D. (Lond.) 5

Cultivation of S. 705 Paddy—
By S. V. Sharma 10

A Brief Note on the Cultivation of Jola (Sorghum) in Mysore—
By T. Srinivasa Murthy, M.Sc. 11

A New Hybrid Groundnut—
By K. Gopala Iyengar 15

Results from Subvention Farms 17

Field Notes—(*From the Civil Vety. Department*) .. 32

What is Showing in the All-India Southern Regional Cattle Show.
Communicated by the Hon. Secretary, The All-India Southern Regional Cattle Show 33

SELECTIONS—
Agriculture in the Mysore State (1940-41) 39

Reviews 41

List of Publications with Important Contents received at The Mysore Agricultural and Experimental Union, Bangalore 43

NOTICE

Members and Subscribers are requested to intimate promptly to the Union Office change of their address, as otherwise, letters and journals sent to them are likely to be delayed or missed altogether.

The Mysore Agricultural Journal

(The Organ of the Mysore Agricultural and Experimental Union)

Vol. XX] 1941—42 [No. 1

Editorial

With this issue we commence the twentieth volume of our *Journal,* the organ of the Mysore Agricultural and Experimental Union. The publication will hereafter be called *The Mysore Agricultural Journal,* a name which has all along been considered to fit in with its contents.

* * *

In our last issue of the JOURNAL, we mentioned some of the activities at present engaging the attention of the Agricultural Department. Further progress has been made in all these directions. In the Maddur and Malavalli area, cotton has been grown over nearly 3,000 acres and a ginning factory is under construction. Arrangements have been made to purchase the cotton from the raiyats. Tobacco has extended considerably in this area and the cured leaf is transported to a grading station newly opened at Closepet. The second agricultural colony in the Irwin Canal area has commenced working with the result that what was a scrubby waste three months before is now a vast field of tobacco. More results from paddy subvention farms have been received and they indicate that a continued effort in this line is bound to be educative.

* * *

The trend of the results from manurial experiments has been to indicate that nearly 75 per cent. of the nitrogenous manures could be applied in the form of locally available bulk products like oil-cakes and compost and that the outlay on manures may be reduced by at least 25 to 40 per cent. in the case of sugarcane and 50 per cent. in the case of paddy, cotton and other crops.

It is natural on the part of the raiyats to evaluate any improvement suggested to them on the grounds of economic soundness and many of the opinions furnished by the raiyats themselves indicate an improvement of at least 20 per cent. wherever the suggestions of the Department of Agriculture regarding seeds and manures have been followed.

Curiosities in Cocoanuts

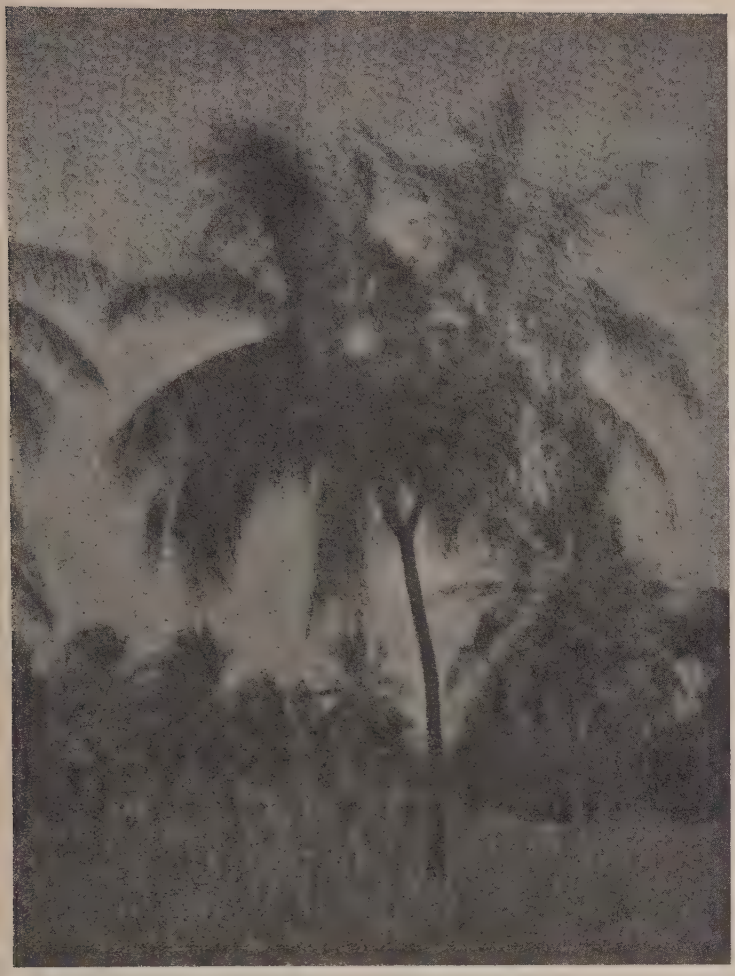
BY

A. K. Yegnanarayana Iyer, M.A., N.D.D., Dip. in Agri.

The cocanut tree is so familiar and so remarkably uniform in its outward characteristics that one hardly has any opportunity of observing variations. Many, however, undoubtedly exist, some of them mere freaks or malformations, others of decided economic importance but also interesting. Several have come under my notice and these are briefly described in this article.

To take the most striking of these first, *viz.*, the stem of the tree. The single straight unbranched cylindrical stem of the tree is its most obvious characteristic as it is of other palms. And yet one does come across what may be called forked or many-branched trees. The accompanying picture is of a tree which has two stems, both of equal and normal size and both bearing crops equally well. It is seldom that such 'branching' as occurs gives rise to stems of equal size and performance; the 'branches' are much smaller and even rudimentary as compared with the main stem. The tree in the second picture is one of this kind; it has quite seven branches springing from near the crown of the main stem. Other trees that I have seen have numerous little branches each attached near a leaf scar on the main stem, like the bulbils on an aloe when it poles or flowers. A whole garden was once come across which was a veritable museum of freaks of this kind. As may perhaps be well-known the 'branching' occurs when the crown suffers damage by the cocoanut beetle or other causes and more shoots than one arise as a result of the stimulus. In some trees, however, there is a tendency for one or more of the inflorescences to become leafy instead of floral, as has been the case in the instance above.

Closely similar to this abnormality is polyembryony or the case of two or even three sprouts to issue out of a single seednut instead of only one as is normally the habit. In such cases one sprout usually smothers the others and only a normal one-stemmed tree grows, but trees have been met with where two have persisted and both into large independent trees right from the ground level. A curious specimen pointed to me was a bush of young cocoanut plants, all springing like suckers from a single parent seed-nut; they were all more or less of the same size and none had developed a bole though



A tree with two stems

ree with seven branches

A tree with shrunken spindly lengths of stem

A tree with large number of fruits

the bush was said to be old enough to develop one. The Government Farm close by had removed and planted out one of these suckers and this was growing normally.

Damage by wind or flood or too close a proximity to large trees like the mango or the jack leads often to the bending of the usually upright stem. The stems either slant away a great deal from the vertical or even lie flat on the ground, according as the damage is slight or severe, but as the years go by, the normal upright growth is resumed with the result that such trees have slanting or prostrate stems for part of their length and upright thereafter. A remarkable case of this kind is a tree which I came across where the stem had twisted itself a few turns in a corkscrew fashion and grown vertically thereafter. It was probably due to the obstruction of some nearby tree which the cocanut tree had persisted in clearing and succeeded too in the attempt. Frequent cases of abnormal stems arise as the result of drought especially in areas where cocoanuts are grown without irrigation; shrunken spindly lengths of stem alternate with normal girths, the former being of course due to periods of drought. The trees in fact present a useful and correct record of the years of drought in the locality.

In regard to the leaves though variations are noticed in the number and size and in the manner of their attachment to the crown which makes the crowns look either compact or loose and open and again in the order of their appearance now clockwise and now counter-clockwise, what may be called a curiosity, was one which had its leaflets all attached together along their margins in the manner we may see in the case of seedling plants.

Likewise in the case of the cocoanut bunch an interesting curiosity is where the fruits are attached to the branch of the inflorescence not by means of a short length of stem or peduncle as is usually the case, but directly and closely packed making the bunch look like a bunch of fruits of the palmyra palm; the Tamil equivalent of "palmyra cocoanut" is indeed the name the tree goes by.

Differences in the size of the fruits, the number per bunch, the size of the nut and the thickness and quality of the meat are all of great economic significance. There are again the obvious familiar differences in the colour of the fruits such as the different shades of green and brown and the beautiful cream colour of the famous King cocoanut, which are all probably correlated with characters of economic value though I have not seen the subject worked out. Large fruits always attract attention and accounts of giant cocoanuts

can be frequently heard. A large fruit is, however, by no means a first class one; it very often contains only an ordinary sized nut while medium sized fruits often have very large nuts. The number of fruits in a bunch also is generally in inverse proportion to their size. While some fifty small to medium sized fruits may be deemed a large number per bunch, curiosities in the form of an unbelievably large number of fruits per bunch are furnished by trees which yield very small fruits.

Variations in the ratio of fibre to the size of the nut give rise to interesting curiosities and freaks. Trees can be seen in which the nut is almost as large as the fruit itself; the husk is so thin that if the fruit is dry the nut can be got at undamaged only by peeling off the husk. At the other end are fruits in which the fibre is so great that the nut is almost non-existent. Between these two extremes can be seen all sorts of variations, the freaks being those in which the nuts become so suppressed as to yield the pigmy nuts which we sometimes see used as a substitute for bottles. I was once called to inspect a garden in which nearly every cocoanut had run to fibre almost entirely, with nuts reduced to next to nothing in size.

A curiosity in regard to the husk is presented by trees in which the unripe husks are sweet and can be eaten. Other trees are famous for the sweetness of the drink afforded by their tender cocoanuts. The meat of the cocoanut presents great variations in composition between one tree and another. As a distinct curiosity, however, may be mentioned the kind in which the copra is soft as butter; it can be crushed into a paste between the finger and the thumb, it eats like butter, leaving little or no chaff to throw out. Another interesting variety is the '*Kapuno*' in which the meal fills the entire cavity of the nut.

There are again the dwarf cocoanuts which are very early bearers and of which plantations are said to exist in parts of the eastern islands. They are said to run into freaks of many kinds; at least one garden in Madras City has several trees of this kind with fruits which are very poor specimens looking like malformations.

The Cultivation of Small Millets in Mysore State

By

Dr. L. S. Dorasamy, M.Sc. (Lond.), Ph.D. (Lond.)

Amongst the small millets—Ragi (*Eleusine coracana*), Same (*Panicum miliare*), Navane (*Setaria italica*), Haraka (*Paspalum scrobiculatum*), Baragu (*Panicum miliaceum*) and Oodalu (*Panicum crusagalli*)—Ragi holds a pre-eminent position in the State. This millet occupies over a third of the cultivated area of about 65 lakhs of acres and forms a staple diet of 80 per cent. of the population. The area under Ragi in British India is nearly 35 lakhs of acres of which more than 50 per cent. is in the Presidency of Madras; thus the area under Ragi in Mysore is more than that in Madras. Further, this State is alone responsible for 85 per cent. of the total area under Ragi in all the Indian States together. The average annual value of the crop is estimated between four to five crores of rupees. The standard out-turn per acre for the Province is approximately four pallas and the actual out-turn varies between two to three pallas (1 palla = 100 seers equal to 205 to 211 lbs. in the case of ragi).

Ragi is grown throughout the State in every district. The contribution from Malnad districts in the west which have a heavy rainfall, is insignificant. Although ragi could be grown in black cotton soils, yet it is replaced by Jola (Sorghum) in the districts of Chitaldrug and parts of Shimoga. Ragi is grown mostly on reddish loamy soils prevailing in the districts of Bangalore, Mysore, Tumkur and Kolar; but practically all kinds of soils are put under this crop such as light sandy soil, and light loamy, gravelly, and stony soils.

Ragi is classified broadly into two types depending on the season in which it is sown, namely, *Kar Ragi* or *Gidda Ragi* and *Hain Ragi* or *Dodda Ragi*. In the western and south-western parts of the State owing to the advent of early rains, early maturing varieties known as *Kar Ragies* are sown during the latter part of April and the beginning of May and harvested in August and September. In the rest of the area which forms the largest tract the late maturing verieties known as *Hain Ragies* are sown in July and harvested in November. *Hain Ragies* when sown in the *Kar* area do not ripen before the advent of rains and they are never sown as such.

Both the *Kar* and *Hain* varieties are grown on dry lands under rain-fed conditions. In addition to these two types, there is another grown under irrigated conditions in the district of Kolar and in the

taluks of Pavagada, Madhugiri, Molokalmuru, Challakere, Hiriyur and Hoskote. These are sown either in December or in July and harvested in March or November.

The ploughing of the soil for ragi begins with the commencement of the first rains, after the previous harvest. The ploughing is repeated three or four times during subsequent showers, after which manure, at the rate of 15–20 cartloads of cattle manure or ten cartloads of tank silt per acre, wherever available, is spread and the land is ploughed once more. Sowing takes place soon after the next favourable rain. Sowing is done either broadcast or in drills. In the eastern portions of the State ragi is usually drill-sown. In parts of western tracts it is still broadcast. In the case of irrigated ragies, the method of transplanting is resorted to. In parts of Tumkur, Mysore and Hassan districts dryland ragi is also transplanted.

The field operation after sowing consists principally of hoeing or interculturing, thinning, weeding and mulching. These operations are done very systematically. Ragi is usually harvested by hand and left in the field for three or four days to dry. Then it is tied into sheaves and carted to the threshing yard, where the sheaves are untied and spread out in a thin layer to dry well. The grain is threshed by means of beating with simple bamboo sticks, or by trampling under the feet of bullocks or by means of a stone-roller. The bulk of the ragi is stored in underground pits of pot-shaped excavations—*hagevu.*

Ragi is usually grown as a pure crop when grown under irrigation. As a dryland crop it is cultivated with subsidiary crops such as Avare (*Dolichos lablab*), Jola (*Andropogon sorghum*), Togari (*Cajanus indicus*) and Niger (*Guizotia abysinica*). No systematic rotation is practised except in one or two exceptional cases. It is usual to grow ragi after ragi, but in Mysore district owing to prevalence of early rains, ragi is not grown year after year on the same area. In such areas during the first year ragi is sown with some *akkadi* or subsidiary crop—horsegram and niger—followed by tobacco in the second year and subsequently with *Kar Ragi* in the third year. Tobacco is replaced in many places by Gingelly (*Sesamum indicum*) and followed by Coriander (*Coriandrum sativum*) or Bengalgram (*Cicer arietinum*). Further when ragi is grown as an irrigated crop it fits into the rotation as an inexpensive but important food in a series of money crops such as sugarcane, paddy and potatoes.

Apart from the breeding of new strains suitable to the different tracts of the State the Department, after a series of trials, is demonstrating and advocating the economic efficiency of deep ploughing, judicious green-manuring with Sann-hemp or Cowpea and the necessity of ploughing with the mould-board plough soon after harvest.

Since 1913 a large number of strains have been evolved by the Department. In the classification of Mysore ragies it has been found useful to group them into seven types based on glume colours (violet, green and pale green) and nature of spikes (compact, open and branching). At the outset over a thousand collections were made from various localities of the State and strains selected. Superior selected strains were grouped together and tested against local for yields over a number of years and those that gave higher yields than that of the local were selected. Amongst the *Hain Ragies* the number of selections or strains is nearly 500. Several of them have been released for general cultivation. Out of these strains, H 22, one of the earliest evolved, is now occupying thousands of acres in the State on account of its superior yield, drought resistance and larger quantity of straw. Recent statistical experiments gave significant results with regard to the varieties H. 2, H. 32, H. 39, H. 45, H. 62, H. 71 and H 73 over that of H. 22. In addition to these strains evolved from Hullubele it is found that selections made from other *Hain* varieties like Modur, Coxcomb, Dharani and Konanakombu, have also given significantly superior yields of straw and grain over that of H. 22.

Like H. 22 in the *Hain Ragies,* K. 1, an early maturing *Kar Ragi*, is very popular in the *Kar* tract. Besides this, H.K. 13 and H.K. 82 are also heavy yielders and are popular. These do well in most of the soils and produce much heavier yields than the local *Kar* mixture. It has been found by sowing improved *Kar* strains the yield is as high as that obtained in the *Hain* tract. Early experiments to improve the condition of ragi growing in the *Kar* area included improvement in the method of sowing by drilling instead of broadcasting. It was found that the compact ear-head varieties had the heaviest ear-heads and that violet open ear-head variety gave the highest yield. There are in all 285 selections of *Kar* varieties, which are under trial in statistical and observational plots. Out of nearly 150 irrigated ragi selections, E.S. 11 and E.S. 13 are outstanding and are far superior to either H. 22 or K. 1. Under irrigated conditions improved *Kar Ragies* could be planted any time but the *Hain* selections could be planted only during the *Hain* season. Transplanting in

ridges is advocated as it ensures a better stand and facilitates irrigation and prevents water-logging. The system of flooding square beds is being put a stop to by propaganda. Despite large number of selections under trial and observation, ear-head selections of promising local varieties growing either on the experimental farms or raiyats' fields in the districts is being continued year after year. In addition to these, exotic varieties from Bombay, Madras and Africa are being grown. Seasonal experiments are being tried. Intercropping of ragi with compatible crops like cotton, togari (*Cajanus indicus*) and horsegram, was found successful and is now being advocated.

Haraka (*Paspalum scrobiculatum*).—Of the other small millets grown in large scale, Haraka occupies an area of 90,000 acres in the State. The bulk of the Haraka crop is grown in the districts of Mysore, Tumkur and Chitaldrug. The season of planting varies in different districts dependent on the advent of rains. Like other millets, this is not grown as a mixed crop but by itself. The average yield per acre is 250–300 seers and the seed rate is approximately 8–9 seers. This millet is not only suitable to grow in poor soils but also on the black-cotton soils and is drought-resistant. Haraka is never grown on the better soils where ragi could be grown. It is commonly followed by a crop of horsegram and the land is seldom manured. It is a crop which takes nearly six months to mature. The plants are cut down as far as the roots, stacked to dry and threshed. Haraka is used like rice by boiling or made into a flour and cooked into a paste like ragi. The straw, though eaten by animals, is not considered as very good. Collection of material from various parts of the State is now being attempted with a view to evolve better strains suitable to the different localities of the State.

Same or Save (*Panicum miliare*).—This is cultivated in poor soils as an alternative crop to ragi. In lands where ragi crops have failed owing to failure of rains and if the end of the season be favourable a crop of *Same* is taken on the land. It is also sown along with ragi in some areas as an *Akkadi* crop—subsidiary crop). There are three kinds of *Same* grown in several parts of the State—*Hari*, *Kari*, and *Bili*. These are never mixed together but grown separately. In lands where *Same* is cultivated as pure crop, horsegram (*Dolichos biflorus*) is sown afterwards. It is reported that *Maliga* or *Hari Same* requires three months for ripening and is preferred when rains begin late. *Bili Same* ripens in 3½ months and *Kari Same* in four months. In favourable seasons the latter

two varieties are used as these give greater amount of straw. In many parts of the State the *Same* straw is considered as better fodder than that of rice and it is preferred even to that of ragi when the straw is mixed with the husks of pulses. The straw is also used for stuffing pack saddles. As already mentioned, *Same* grows even in the worst soils without the aid of much manure. The yield of grain is on the average 200–300 seers.

Navane (*Setaria italica*).—Except in small holdings of half to one acre, this millet is never raised as a pure crop. It is grown with ragi as an *akkadi* crop in many places and also with cotton. The millet is usually cultivated during the *Hain* season and with the onset of heavy rains the seed is sown and ploughed in. When cultivated as a pure crop it requires neither weeding nor hoeing and ripens in three months. The grain is cooked whole like rice or ground into flour and eaten after boiling it to a paste—*hittu*. The straw is much relished by cattle and is considered next to ragi in quality. In the Mysore district two varieties are cultivated—*Gidda* or short and *Dodda* (also called *Jotu*) or long. In the district of Tumkur three kinds of Navane are found: (*a*) *Bili,* cultivated under irrigation, (*b*) *Kempu,* cultivated in garden lands with partial shade, and (*c*) *Motu,* which is cultivated in dry fields. The yield like that of other millets averages between 200–300 seers per acre.

Baragu (*Panicum miliaceum*).—It is very drought resisting and grows on any poor soil. The two varieties, white and black baragu, are under cultivation. It ripens in three months and is rarely grown as a pure crop except in cases of such lands where ragi does not grow. Like other millets it is also grown as an *akkadi* crop. The grain is relished and cooked whole or entire like rice. The straw is sometimes used as fodder, otherwise as fuel.

Oodalu (*Panicum crusgalli*).—The cultivation of this is not extensive and follows the same method as that of other small millets. The yield, like that of Baragu (*Panicum miliaceum*), is between 200–300 seers.

Except in the case of Same (*Panicum miliare*), where some varieties are under observation, no work has yet been undertaken on the small millets owing to the paucity of staff and due to greater concentration on the breeding of ragi varieties. But arrangements have been recently made to secure local strains of all the small millets and grow them for observation and further study during the coming season.

Cultivation of S. 705 Paddy

By

S. V. Sharma

S. 705 paddy may be grown without puddling and continuous flooding, under the following method:—

(1) The seeds may be sown direct into the fields in furrows, one foot apart, thinned with *yedekunte* and plants earthed up by passing country ploughs in between the furrows.

Or

(2) Separate nursery raised by dry method and seedlings transplanted in rows or in beds as in the case of irrigated ragi.

If row sowing method is adopted, zigzag method of irrigation is recommended, so that water may be impounded uniformly in the field. In the case of the bed method, the beds may be filled with water. Irrigation may be given once in three or four days throughout the growing period, the irrigation being more frequent at the later stages of plant growth. It is advisable to retain a certain amount of moisture in the soil always; but the water given once should entirely soak through, before the second irrigation is given, so as to avoid the breeding of mosquitoes in the fields. One thing to be borne in mind in this case is that the field in which this paddy is meant to be grown as a garden crop should not be puddled but worked as garden soil.

A Brief Note on the Cultivation of Jola (Sorghum) in Mysore

By

T. Srinivasa Murthy, M.Sc.

Jola is the third staple cereal in the State and occupies about a tenth of the total area under cultivation. The area under this crop is slightly more than a quarter of the acreage under Ragi (*Eleusine coracana*) being next to it in importance.

Commercially, jola is more important than ragi. Considerable quantities of it are being exported. During the period 1913–14 to 1936–37 an average of 322,297 railway maunds was exported annually from the State. There is a considerable fluctuation in the quantities exported. The highest and lowest exports during the period being as follows:—

Year	Quantity in Maunds	Value in Rs.
1926–27	800,716	31,88,882
1913–14	405,000	37,12,700
1920–21	87	3,420

A considerable quantity is exported by road also.

About 95 per cent. of the quantity exported is absorbed by the Madras Presidency. Very little jola is imported into the State except in a few abnormal years.

The acreage under jola has fluctuated widely from time to time. An average of 644,383 acres has been under this crop during the period, 1905 to 1937. The highest and the lowest acreage occupied by the crop during this period is as follows:—

Year	Area in acres
1929–30	759,700
1904–05	506,397

Chitaldrug and Mysore are the principal districts where jola is grown considerably. There is also appreciable acreage under this crop in parts of Shimoga, Tumkur, Kadur and Hassan. Wide fluctuation in the acreage is particularly noticeable in the districts of Tumkur and Kolar. In the different districts of the State the following areas were under jola during the year 1936–37:—

District	Acres
Chitaldrug	277,214
Mysore (including Mandya)	217,057
Shimoga	79,584
Tumkur	43,754
Kadur	28,528
Hassan	14,996
Kolar	3,667
Bangalore	851

There is considerable variation in the total production of jola from year to year on account of the seasonal conditions. The average production of jola for the past 33 years is 1,071,283 pallas. The highest and the lowest quantities produced during the 33-year period are given below:—

Year		Quantity in Pallas
1909–10	..	1,668,826
1923–24	..	706,475

Jola is the main food crop in Chitaldrug and parts of Shimoga and is an important food and fodder crop in Mysore District. It is cultivated throughout the State except in Malnads under very heavy rainfall conditions. It is grown either as a pure crop or as *akkadi* lines with other crops. It is grown on every type of soil from the rich deep black cotton soil of Chitaldrug which is the best type of soil for the crop, to red-loamy soils, where good crops are raised and in the gravelly and even stony soils which are considered unfit for ragi. Jola is cultivated throughout the year under irrigation for fodder. As a rain-fed crop the earliest or *Mungar* sowings take place during

Bharani and *Krittika* rains (April and May) in the southern portions of the State and extends up to *Hastha, Chitta* and early *Swathi* rains (September and October) in the north.

Hingar Tract.—About 300,000 acres are under jola in the black cotton soils of Chitaldrug, Shimoga and Tumkur, which form the southern fringe of black cotton soil area comprising portions of Central Provinces, Hyderabad, Bombay and Madras. The rainfall here varies from 18 to 20 inches. Jola is chiefly grown as a pure crop and is sown in the *Hastha* and *Chitta* rains during September-October and is harvested during February-March.

Bili jola is the principal variety cultivated in this tract. Several types are distinguished popularly in *Bili* jola by the colour of the glumes as (1) Black glume, (2) Red glume having sweet stem and earliness and (3) White glume having pithy stem and soft grains. *Bili* jola is also distinguished by the size of grains as, (1) *Sanna bili* jola having small grains, (2) *Dodda bili* jola or *Mara* jola having large grains and thick stems particularly grown in deep rich soils, (3) *Sakkare* jola having small wrinkled sweet grains and (4) *Kabbu-dantu* jola having sweet stem. All these types are characterised by their very compact earheads. Raichur jola and Jubbalpuri jola having semi-compact earheads with large grains which have been probably imported are also being cultivated to a small extent here and there. *Bili* jola and *Dodda bili* jola are the principal varieties grown, the other varieties having a very limited cultivation.

As jola forms the main food crop in this tract and supplies valuable fodder, any scheme for the improvement of this crop in these parts of the State should necessarily take cognisance of the dual purpose. In a few portions of Chitaldrug District where the soil is not of black cotton type, *Mungar* jola is also grown as a rain-fed crop and to a little extent as an irrigated crop for fodder purposes. It is grown as a pure crop or as an *akkadi* crop with avare (*Dolichos lablab*), togari (*Cajanus indicus*), alsande (*Vigna catiang*), horsegram (*Dolichos biflorus*), etc. Of the several varieties under cultivation, the more important are *Kesari* jola having red grains; *Vogaru* jola, a purely fodder variety, the grains being unfit for human consumption; *Haladi* jola, with yellow grains; *Gidda-thimmana* jola having sweet stem and white grains; and *Basavana padada* jola or *Dodda* jola having large yellow grains. *Kesari* jola is gradually replacing the other types on these soils.

Kar Tract.—Over 220,000 acres are under *Mungar* jola round about Mysore, which is the principal *Mungar* tract. Jola is one of

the important crops in this region being grown chiefly for fodder. *Kaki* jola, having chocolate-coloured grains and semi-compact earheads, and *Vogaru* jola are the principal varieties cultivated. On the black cotton soils of Chamarajanagar, Gundlupet and T. Narasipur *Bili* jola is grown to a fair extent, the crop here serving a dual purpose of food and fodder as in Chitaldrug District and the types being distinguished as *Muddaga* (compact earhead), *Aremuddaga* (semi-compact) and *Choliga* (loose earhead).

The crop is sown during April and May and harvested during September. The crop is cut and dried and fed to the cattle at a time when no ragi straw is available. It is mostly grown as a pure crop and admits of a second crop of horsegram, avare, etc., during the *Hingar* season. Since it is an important fodder crop in this tract, improvement will consist chiefly of early fodder types with good grain yield.

Other Tracts.—Bili jola is also grown in a few fields in the north of Tumkur District under irrigation. The soil is a rich black clay and only a single crop is usually taken. It is sometimes sown in place of *Vaisaka* crop of paddy when there is insufficient supply of water from tanks for paddy cultivation.

In Bangalore and Kolar several varieties of jola are grown either as a pure crop or as *akkadi* rows in *Hain* ragi; *Vogaru* jola and *Kedaru* or *Muthina* jola (very loose earhead) are the chief varieties raised.

A New Hybrid Groundnut

By

K. Gopala Iyengar

The varieties of groundnuts which are under cultivation can be grouped under two classes: the erect and the spreading. In the erect varieties the plant is upright and the pods are borne in a cluster around the roots, which facilitates the harvest. In the spreading varieties the plant trails along the ground, the pods being borne all along on the lower side of the branches. This results in the harvest being costly and laborious as a larger area has to be dug for gathering the pods. Apart from their habit, the groundnuts can be differentiated by the period they take for becoming ripe. Thus, Valencia is the earliest, reaching maturity in just over three months. Spanish and Small Japan reach maturity in about four months and varieties like bunch Virginia need five months. Of the spreading varieties, while Mauritius and Barbados take about four and a half months to ripen, the very late ones like Mysore local need more than six months. The long duration spreading varieties are not suited to regions whose range of rainfall is limited. Usually the erect varieties are slightly richer in oil than the spreading ones. The pods of the spreading varieties are generally medium to large and two- to three-seeded, whereas those of erect ones are usually small to medium and two-seeded.

While selection has been of some utility in the improvement of groundnut, its applicability is rather limited. By selection alone it is not possible to eliminate the undesirable features that are inherent in the two classes of groundnuts. The chief aim of groundnut improvement is to bring together such desirable characters as earliness, high oil content, ease of harvest, and desirable pod-size and high yield. To achieve the above object a series of crosses have been effected between erect and spreading varieties. Our aim has been achieved to a considerable extent in the variety, H.G. 1, which is of hybrid origin, but for a few shortcomings such as late maturity.

Recently a new cross between Spanish and Barbados has shown considerable promise. Spanish is an extensively cultivated erect variety of short duration, bearing small two-seeded pods rich in oil.

Barbados is a spreading variety of medium duration, bearing two to three-seeded pods which are larger in size than those of Spanish. Though not cultivated extensively, it has been known to be a fairly heavy yielder.

This new hybrid which is now being tried on a field scale and provisionally named G. 0173 is an erect short duration type like Spanish, and is ready for harvest after 120 days. It bears one- to three-seeded pods, intermediate in size between those of H.G. 1 and Spanish. The strain is very vigorous, growing to a height of about 1½ feet, the plants being taller than those of Small Japan, which is known to be the most vigorous erect variety. The colour of the seed is light creamy brown. In a recent preliminary summer trial under irrigated conditions on the Irwin Canal Farm, its performance in comparison with Spanish is as follows:—

Variety	Pods per acre in pallas	Green haulms per acre in tons	Shelling %	Oil content %
Spanish	14	2·41	75	49·2
G. 0173	20½	7·67	69	48·0

From the above figures the calculated yield of kernel will be nearly 1,400 lbs. for G. 0173 as compared to 1,030 lbs. for Spanish. Another point in its favour is the great quantity of green haulms obtained from G. 0173. Further yield trials are being conducted which will be reported later.

Results from Subvention Farms

An yield statement of a *Kar* Ragi Subvention Farm at Hunsur has been given in the April-June 1941 issue of the *Journal* along with a description of what a subvention farm is. More results are gathered here, which indicate *inter alia* that the raiyats have understood the utility of the model method of experimentation.

(1)

Paddy Subvention Farm at Doddamalur, Channapatna Taluk, Bangalore District, in the holding of Mr. E. G. Rajan:—

1. *Situation.*—Behind Malur tank.
2. *Soil.*—Varying from sandy loam to clay.
3. *Previous Crop.*—Summer paddy.
4. *Method of Cropping.*—Transplantation.
5. *Manure Used.*—10 Cartloads of cattle manure per acre and fertilizers recommended by the Agricultural Department after transplantation.
6. *Opinion.*—S. 139 and S. 699 are in demand by the surrounding raiyats. S. 246, though it has yielded high, gives only 45 per cent. rice when pounded, which fact is against it.

(1)

Variety of Paddy	Area of Plot Guntas*	Date of Sowing Seed in Nursery	Date of Trans-plantation in the Field	Date of Harvest	Yield per Plot		Yield per Acre		Duration of Crop Days
					Grain Seers	Straw Bundles	Grain Seers	Straw Bundles	
S. 199	15	1–8–1940	31–8–1940	5–12–1940	370	16	987	43	126
S. 246	20	2–8–1940	2–9–1940	16–12–1940	790	32	1,580	64	136
S. 661	17	3–8–1940	3–9–1940	17–12–1940	470	32	1,100	74	136
S. 699	20	8–8–1940	9–9–1940	30–12–1940	690	30	1,380	60	144
S. 624	20	1–8–1940	31–8–1940	26–12–1940	630	22	1,260	44	147
S. 476	16	1–8–1940	31–8–1940	31–12–1940	420	20	1,050	50	152
S. 139	17	3–8–1940	3–9–1940	4– 1–1941	620	34	1,460	80	154
S. 67	17	3–8–1940	3–9–1940	5– 1–1941	525	24	1,235	58	155

* 40 *Guntas* = 1 Acre.

(2)

Paddy Subvention Farm at Ballalsamudra, Srirampur Hobli, Hosadurga Taluk, Chitaldrug District, in the holding of Mr. S. C. Madangopal Naidu:—

1. *Soil.*—Black loam.
2. *Previous Crop.*—*Local Sanna* summer paddy.
3. *Manure Used.*—8 Cartloads of *Honge* leaf.
4. *Method of Sowing.*—Sprouted seed sowing.
5. *Date of Sowing.*—22-8-1940 (Seed set for sprouting on 18-8-1940).
6. *Extent.*—Each strain grown on 8 guntas.
7. *Opinion.*—S. 236, S. 699 and S. 661 seem to be suitable to this tract. S. 831 is a small grained variety that is liked as much as the above and therefore may be given a further trial.

Variety of Paddy	Date of Harvest	Yield per Plot		Yield per Acre	
		Grain Seers	Straw Bundles	Grain Seers	Straw Bundles
Local Paddy ..	22–12–1940	229	34	1,145	170
S. 197	24–12–1940	254	41	1,270	205
S. 236	8– 1–1941	298	41	1,490	205
S. 661	8–1 –1941	292	41	1,460	205
S. 624	10– 1–1941	250	33	1,250	175
S. 476	13– 1–1941	225*	56	1,125	180
S. 699	13– 1–1941	257	44	1,285	220
S. 831	13– 1–1941	78†	16	390	80
S. 799	13– 1–1941	235	42	1,175	210

* Much of empty seed. † Loss by birds.

(3)

Paddy Subvention Farm at Bhadravati, Shimoga District, in the holding of Mr. Panduranga Setty:—

1. *Situation.*—Under Bhadra Nala.
2. *Soil.*—Sandy-loam and clay-loam in part.
3. *Previous Crop.*—Paddy.
4. *Manurial Treatment.*—15 Cartloads of cattle manure in last week of July 1940.
5. *Seed Sown in Nursery.*—2-7-1940.
6. *Transplanted.*—7th, 8th and 9th August 1940.

(3)

Variety of Paddy	Date of Harvest	Yield per Plot (per ¼ acre)		Yield per Acre	
		Grain Seers	Straw lb.	Grain Seers	Straw lb.
S. 699	7–12–1940	655	1,079	2,620	4,316
S. 246 ..	30–11–1940	440	895	1,760	3,580
S. 139	23–12–1940	262	742	1,048	2,968
S. 624	23–12–1940	422	939	1,688	3,756
S. 67	16–12–1940	235	707	1,040	2,828
S. 476	23–12–1940	220	699	880	2,796
S. 199	29–11–1940	340	490	1,360	1,960
S. 661	8–12–1940	290	475	1,160	1,900
S. 269	1–12–1940	188	395	752	1,580
Local	..	500	1,089	2,000	4,356

(4)

Paddy Subvention Farm at Shanubhoganahally, Amritur Hobli, Kunigal Taluk, Tumkur District, in the holding of Mr. K. Ramaswamy Iyengar:—

1. *Situation.*—Marconhally area (comes under irrigation newly).
2. *Soil.*—Red and sandy loam.
3. *Previous Crop.*—Ragi as a dry crop.
4. *Seed Sown* in Nursery on 2-8-1940.
5. *Transplanted* from 5-9-1940 to 13-9-1940. Each variety planted in 10 guntas.

Variety of Paddy	Date of Harvest	Yield per Plot Grain—Seers	Yield per Acre Grain—Seers
S. 139	30–12–1940	194	776
S. 199	25–12–1940	170	680
S. 661	27–12–1940	240	960
S. 246	27–12–1940	282	1,128
S. 699	29–12–1940	288	1,152
S. 67	5– 1–1941	183	732
S. 476	3–1 –1941	207	828
S. 624	28–12–1940	266	1,064
Local *Pattasamanahally* ..	5– 1–1941	273	1,092

(5)

Paddy Subvention Farm at Ayanur, Kumsi Sub-Taluk, Shimoga District, in the holding of Mr. Anche Basappa:—

1. *Situation.*—Tank irrigated area.
2. *Soil.*—Sandy loam.
3. *Previous Crop.*—Paddy.
4. *Method of Cultivation.*—Dry sown and irrigated land.
5. *Manure.*—12 Cartloads of cattle manure.
6. *Paddy drilled* on 15-7-1940.

Variety of Paddy	Date of Harvest	Yield per Plot		Yield per Acre
		Grain Seers	Straw lb.	Grain Seers
S. 699	30–11–1940	200	413	1,600
S. 246	30–11–1940	248	750	1,984
S. 139	7–12–1940	218	625	1,744
S. 624	7–12–1940	252	585	2,016
S. 67	7–12–1940	128	478	1,024
S. 476	7–12–1940	165	720	1,320
S. 199	30–11–1940	227	505	1,876
S. 661	30–11–1940	145	245	1,160
S. 269	30–11–1940	259	500	2,072

(6)

Paddy Subvention Farm at Shivapur, Kasaba Hobli, Doddaballapur Taluk, Bangalore District, in the holding of Mr. H. C. Papanna, Jodidar, Doddaballapur:—

1. *Nature of Soil.*—Light clay.
2. *Previous Crop.*—Summer or *Vaisakhi* paddy.
3. *Sprouted Paddy Sown* on 29-8-1940.
4. *Area of Each Plot.*—⅜ of an acre in extent.
5. *Manurial Treatment.*—1 Ton of *honge* cake to the whole area on 15-10-1940 at first weeding.

(6)

Variety of Paddy	Date of Harvest	Yield per Plot		Yield per Acre	
		Grain Seers	Straw lb.	Grain Seers	Straw lb.
S. 661	28–1–1941	203	450	541	1,200
S. 199	5–1–1941	192	600	512	1,600
S. 699	26–1–1941	200	450	533⅓	1,200
S. 476	27–1–1941	180	520	480	1,386⅔
S. 246	25–1–1941	180	400	480	1,016⅔
S. 67	24–1–1941	200	630	533⅓	2,480
S. 624	29–1–1941	30	450	80	1,600
S. 139	8–2–1941	280	700	746⅔	1,866⅔
Doddabyra (2 acres) ..	..	800	2,300	400	1,150

Note.—The yields are generally low due to late sowing.

(7)

Paddy Subvention Farm at Lakshmipur, Nelavanki Hobli, Srinivasapur Taluk, Kolar District, in the holding of Mr. M. Pattabhi Rama Rao:—

1. *Soil.*—Clayey loam.
2. *Previous Crop.*—*Vaisakhi* paddy.
3. *Manure.*—8 Cartloads or 240 bundles of *honge* leaves per acre and cattle manure, 10 cartloads.
4. *Date of Sowing.*—15th, 18th and 21st August 1940.

(7)

Variety of Paddy	Area of Plot Guntas	Date of Harvest	Yield per Plot Grain—Seers	Yield per Acre Grain—Seers
S. 199	7¾	20–12–1940	216	1,115
S. 624	6¼	25– 1–1941	108	691
S. 139	5¾	23– 1–1941	250	1,739
S. 699	9 4/11	17– 1–1941	210	897
S. 476	12¾	23– 1–1941	180	565
S. 661	9 16/33	17– 1–1941	230	970
S. 67	8 25/33	24– 1–1941	190	874
S. 246	7	9– 1–1941	184	1,051
Local *Bhyra Batta* ..	1 acre	25–12–1940	459	459

Note.—The prices fetched by the strains are as follows per palla:—S. 199, Rs. 7–0–0; S. 624, Rs. 6–0–0; S. 139, Rs. 7–8–0; S. 699, Rs. 7–0–0; S. 476, Rs. 7–8–0; S. 661, Rs. 8–0–0; S. 67, Rs. 6–8–0; S. 246, Rs. 8–0–0.

(8)

Paddy Subvention Farm at Rupen Agrahara, Bangalore Taluk, in the holding of Mr. Ramiah of Adugodi:—

1. *Soil.*—Clayey; old paddy soil.
2. *Previous Crop.*—Paddy.
3. *Manure.*—Cattle manure at 12 cartloads per acre.
4. *Date of Sowing in Nursery.*—29-6-1940.
5. *Date of Transplantation.*—28th and 29th July 1940.

(8)

Variety of Paddy	Area of Plot Guntas	Date of Harvest	Duration of Crop		Yield per Plot		Yield per Acre	
			Months	Days	Grain Seers	Straw lb.	Grain Seers	Straw lb.
S. 67	10	28–12–1940	5	0	616	1,072	2,464	8,288
S. 139	10	17–12–1940	5	0	600	2,002	2,400	8,008
S. 199	11	27–11–1940	4	0	480	1,400	1,920	5,600
S. 699	11	14–12–1940	4	15	656	1,450	2,385½	5,273
S. 661	10	14–12–1940	4	15	640	1,250	2,560	5,000
S. 246	8	6–12–1940	4	7	480	1,651	2,400	8,255
S. 476	12	4– 1–1941	5	5	620	1,597	2,066	5,323
S. 624	12	18–12–1940	4	19	456	1,117	1,520	3,723
Local *Halubbalu*	7	23–11–1940	3	25	300	600	1,714	3,428

(9)

Paddy Subvention Farm at Maddur, Mandya District, in the holding of Mr. P. Sivalingiah: —

1. *Soil.*—Clay loam.
2. *Previous Crop.*—Paddy.
3. *Manure*—408 lb. of paddy mixture applied equally to all plots.
4. *Nursery Sown* on 4-7-1940.
5. *Date of Transplantation.*—1-8-1940.

Variety of Paddy	Area of Plot Guntas	Date of Harvest	Yield per Plot Grain—Seers	Yield per Acre Grain—Seers
S. 67	10	17–12–1940	430	1,720
S. 661	10	18–12–1940	280	1,120
S. 139	10	19–12–1940	330	1,320
S. 476	10	17–12–1940	380	1,520
S. 246	10	10–12–1940	330	1,320
S. 199	10	4–12–1940	240	960
S. 699	10	10–12–1940	240	960
Local Check ..	24	10–12–1940	720	1,200

(10)

Paddy Subvention Farm at Saklespur, Hassan District, in the holding of Mr. Malali Eerappa:—

1. *Soil.*—Clayey loam.
2. *Previous Crop.*—Paddy.
3. *Manure.*—5 Cartloads farmyard manure at ploughing time; 101 lb. ammonium sulphate and 81 lb. superphosphate just before transplanting.
4. *Nursery Sown* on 26-5-1940.
5. *Transplanted* on 31-7-1940.
6. *Area of Each Plot.*—6 Guntas.

(10)

Variety of Paddy	Date of Harvest	Yield per Plot Grain—Seers	Yield per Acre Grain—Seers
S. 661	19–12–1940	198	1,320
S. 199	5–12–1940	206	1,373
S. 699	17–12–1940	219	1,460
S. 476	25–12–1940	198	1,320
S. 624	17–12–1940	177	1,180
S. 139	25–12–1940	218	1,453
S. 67	18–12–1940	195	1,300
S. 246	5–12–1940	150	1,000
Local Paddy	18–12–1940	212	1,413

(11)

Paddy Subvention Farm at Siddanahally, Madhugiri Taluk, Tumkur District, in the holding of Mr. Sreenivasa Murthy Rao, Siddanahally:—

Variety of Paddy	Area of Plot Guntas	Date of Sowing or Transplanting	Date of Harvest	Yield per Plot		Yield per Acre	
				Grain Seers	Straw lb.	Grain Seers	Straw lb.
S. 705	20	27–2–1940	28–5–1940	850	1,716	1,700	3,432
S. 317	20	27–2–1940	1–6–1940	757	2,040	1,534	4,080
S. 547	20	27–2–1940	9–6–1940	680	1,950	1,360	3,900
Manurial Plot							
S. 705	20	27–2–1940	28–5–1940	950	1,914	1,900	3,828
„ Check ..	20	27–2–1940	28–5–1940	360	762	720	1,452
S. 317 (Bulk) ..	12	27–2–1940	1–6–1940	453	1,535	960	3,070

S. 705 has taken 136 days from date of sowing to harvest.
S. 317 „ 140 „ „ „
S. 547 „ 148 „ „ „

(12)

Paddy Subvention Farm at Aralamallige, Doddaballapur, Bangalore District, in the holding of *Lokasevanirata* Kongadiappa:—

1. *Soil.*—Light clay.
2. *Previous Crop.*—Paddy.
3. *Nursery of the Crop Sown* on 31-1-1941.

4. *Manure.*—Groundnut cake applied at transplanting time.
5. *Date of Transplantation.*—9th to 12th March 1941.
6. *Opinion.*—I have been growing paddy in these plots since 1934. The new varieties have yielded a crop superior to any in the previous years. S. 317 has given the highest yield among the new varieties tried here.

Variety of Paddy	Date of Harvest	Yield per Plot		Yield per Acre	
		Grain Seers	Straw lb.	Grain Seers	Straw lb.
Dodkesarike ..	29-6-1941	418	1,425	1,114	3,800
S. 317	22-6-1941	670	1,575	1,786	4,200
S. 396	29-6-1941	450	1,350	1,200	3,600
S. 547	27-6-1941	612	1,200	1,632	3,200
S. 705	28-6-1941	550	1,125	1,466	3,000

(13)

Paddy Subvention Plot at Holenarasipur, Hassan District, in the holding of Mr. B. Venkatappa:—

1. *Soil.*—Sandy red loam.
2. *Previous Crop.*—Paddy.
3. *Manure.*—Sannhemp raised *in situ* and ploughed in all 200 lb. groundnut cake and 60 lb. of concentrated superphosphate per acre, applied on 1-8-1940.
4. *Seed Sown in Nursery* on 21-6-1940.
5. *Transplanted* on 1-8-1940.

Variety of Paddy	Date of Harvest	Yield per Plot Grain—Seers	Yield per Acre Grain—Seers
S. 199	2-12-1940	500	1,407
S. 139	24-12-1940	400	1,008
S. 246	11-12-1940	700	1,446
S. 476	28-12-1940	450	1,192
S. 661	19-12-1940	810	2,227
S. 624	21-12-1940	720	1,894
S. 699	19-12-1940	820	2,090
S. 67	30-12-1940	450	1,078

(14)

Paddy Subvention Farm at Kantanahally, Amritur Hobli, Kunigal Taluk, Tumkur District, in the holding of Mr. Kempali Gowda:—

1. *Situation.*—Marconhally area. Newly brought under irrigation.
2. *Soil.*—Gravelly red soil.
3. *Previous Crop.*—Dry ragi crop.
4. *Manure.*—8 Cartloads of cattle manure and 40 bundles of *honge* leaves per acre, on 17-9-1940.
5. *Seed Sown in Nursery* on 30-7-1940 and 31-7-1940.
6. *Transplanted* from 17-9-1940 to 22-9-1940.
7. *Area of Each Plot.*— 10 Guntas.
8. *Harvest.*—3-1-41 to 19-1-1941.

Variety of Paddy	Yield per Plot Grain—Seers	Yield per Acre Grain—Seers
S. 139	295	1,180
S. 199	120	480
S. 661	170	680
S. 246	170	680
S. 699	210	840
S. 624	168	672
S. 67	132	528
S. 476	132	528
Local *Bili Sanna* ..	210	840

(15)

Paddy Subvention Farm, Ramanathpur, Hassan District, in the holding of Mr. R. S. Ramaswamy Iyengar:—

1. *Soil.*—Red loam.
2. *Previous Crop.*—Paddy.
3. *Manure.*—Cattle manure at 8 cartloads per acre applied on 14-8-1940. Fertilizers at 75 lb. of ammonium sulphate and 60 lb. concentrated supers on 29-8-1940.

4. *Seed Sown in Nursery* on 28-6-1940.
5. *Transplanted* on 20th and 31st August 1940.
6. *Area of Each Plot.*—10 Guntas.
7. *Harvest.*—15-12-1941 to 26-12-1941.
8. *Opinion of the Raiyat.*—S. 139 and S. 661 seem suited to this locality. S. 199 and S. 699 do not seem to thrive. S. 67, S. 624 and S. 246 may be tried once again. S. 476 came up well in the beginning but was full of empty seed at harvest. This is rather strange and another trial may be given to this paddy.

Variety of Paddy	Yield per Plot		Yield per Acre	
	Grain Seers	Straw lb.	Grain Seers	Straw lb.
S. 661	360	762	1,440	3,048
S. 624	286½	692	1,146	2,768
S. 246	258	626	1,032	2,504
S. 199	232	614	928	2,554
S. 699	182	392	728	1,568
S. 476	133	1 cart-load	452	4 cartloads
S. 67	348	½ „	1,392	2 „
S. 139	370	½ „	1,480	2 „
Local *Bili Bhatta* ..	305	½ „	1,220	2 „

(16)

Paddy Subvention Farm at Kodagalli, T. Narsipur Taluk, Mysore District, in the holding of Mr. Javaregowda:—

1. *Situation.*—Channel area.
2. *Soil.*—Red loam.
3. *Previous Crop.*—Paddy.
4. *Manure.*—Green manure sown and ploughed under *in situ* and 10 cartloads of farmyard manure.
5. *Nursery Sown* on 26-6-1940.
6. *Transplantation* in field on 14-8-1940.
7. *Area of Each Plot.*—6 Guntas.

(16)

Variety of Paddy	Date of Harvest	Yield per Plot Grain—Seers	Yield per Acre Grain—Seers
S. 246	6-12-1940	290	1,933
S. 199	6-12-1940	240	1,600
S. 67	15-12-1940	328½	2,170
S. 699	7-12-1940	305	2,033
S. 139	15-12-1940	295	1,966
S. 624	15-12-1940	392	2,613
S. 661	7-12-1940	375	2,500
S. 476	15-12-1940	442	2,946
G.E.B. 24 (Local seed) Check	7-12-1940	298	1,986

(17)

Paddy Subvention Farm at Krishnarajapet, Krishnarajapet Taluk, Mandya District, in the holding of Mr. Channe Gowda:—

1. *Situation.*—Under Krishnarajapet tank.
2. *Soil.*—Clay loam.
3. *Previous Crop.*—H.M. 606 and H.M. 607 sugarcane.
4. *Manurial Treatment.*—6 Cartloads of green leaves and 16 cartloads of cattle manure.
5. *Date of Sowing in Nursery.*—18th and 22nd June 1940.
6. *Date of Transplantation.*—25-7-1940.

Variety of Paddy	Area of Plot Guntas	Date of Harvest	Yield per Plot Grain Seers	Yield per Acre Grain Seers	Remarks
S. 699	20	4-12-1940	800	1,600	Heavy straw
S. 476	20	4-12-1940	746	1,492	
S. 661	20	30-11-1940	1,281	2,562	
S. 139	20	4-12-1940	1,000	2,000	
S. 684 Check ..	20	30-11-1940	960	1,920	
S. 624	20	4-12-1940	785	1,570	
S. 246	20	30-11-1940	1,020	2,040	
S. 67	20	4-12-1940	800	1,600	
S. 199	20	20-11-1940	1,050	2,100	

Note.—The harvested crop suffered from continuous rains. Yields above 2,000 seers per acre may be considered good.

(18)

Paddy Subvention Farm at Horalawadi, Nanjangud Taluk, Mysore District, in the holding of Mr. A. Rama Rao:—

1. *Locality.*—Wet lands under Hullahalli Channel.
2. *Soil.*—Clayey loam.
3. *Previous Crop.*—Paddy.
4. *Manure.*—Green manure grown and ploughed under *in situ.* 10 Cartloads of cattle manure per acre.
5. *Transplantation* in field on 4-8-1940.

Variety of Paddy	Area of Plot Guntas	Date of Harvest	Yield per Plot Grain—Seers	Yield per Acre Grain—Seers
S. 67	11	16-12-1940	475	1,727
S. 661	9¼	9-12-1940	370	1,558
S. 699	9¼	9-12-1940	411	1,736
S. 139	12½	25-12-1940	460	1,472
S. 246	9	1-12-1940	409	1,818
S. 476	10	30-12-1940	350	1,400
S. 624	9¾	9-12-1940	404	1,658
S. 199	11½	28-11-1940	500	1,740
Local *Kaddi* (Check) ..	11	25-12-1940	392¾	1,428

(19)

Paddy Subvention Farm at Hadisettihally, Seringapatam Taluk, Mandya District, in the holding of Mr. Siddappa *alias* Papanna:—

1. *Soil.*—Sandy with gravel underlying.
2. *Manurial Treatment.*—Green manures grown *in situ* and ploughed in.
3. *Nursery.*—Seeds sown in nursery on 27-6-1940.
4. *Date of Transplantation.*—11-8-1940.
5. *Date of Harvest.*—13-12-1940 to 15-12-1940.

Variety of Paddy	Area of Plot Guntas	Yield per Plot Grain—Seers	Yield per Acre Grain—Seers
S. 661	5	208	1,664
S. 624	10	336	1,344
S. 246	5	250	2,000
S. 699	5	208	1,664
S. 139	5	184	1,472
S. 476	5	176	1,408
S 67	3	104	1,387
S. 199	5	200	1,600

FIELD NOTES

(From the Civil Veterinary Department)

Treatment of Mange in Dogs

(1) The affected parts to be nicely clipped and cleaned and Olium Cade to be applied daily for 10 to 15 days.

(2) Injection of sterile milk, 2 c.c., subcutaneously on alternate days,—4 or 5 injections.

The above treatment has been very useful and some dogs have been cured within 15 to 20 days.

M. Abdul Rahiman,
Veterinary Inspector, Kadur.

What is Showing in the All-India Southern Regional Cattle Show at Bangalore

Communicated by
The Honorary Secretary, All-India Southern Regional Cattle Show

The Fifth All-India Cattle Show will be held in New Delhi in February 1942. In this connection two regional shows have been arranged to precede the one at Delhi, one for Western India at Bhavanagar and one for Southern India at Bangalore. An allocation has been made of different breeds of cattle, buffaloes, sheep and goats of particular interest to the tracts to be exhibited at the regional shows. As stated in the Prospectus issued in this connection, the regional shows have been organised in view of the size and the variety of the country and in view of the fact that one central show is not sufficient by itself for the whole of India. Delhi itself will be the venue of the northern regional show and the two additional shows have been arranged at the Centres noted above for the year 1941-42. The southern regional show at Bangalore will be held from the 17th to the 20th of January 1942, both days inclusive. Short notes on the breeds allocated to this Centre are given below:—

Amrit Mahal.—This is one of the best known draught breeds of India. Its home is in Mysore State, where Government herds of selected cattle are still maintained which have been in existence since they were formed by former Rulers of Mysore to breed draught cattle for their campaigns.

They are very fiery, active cattle and are famous for their power of endurance. They possess the same superiority over other draught breeds in every valuable quality that Arabs do over other horses. The cows are poor milkers.

Bargur.—This breed of cattle is bred extensively in the Bargur Hills in the Coimbatore District of the Madras Presidency.

They resemble the Mysore Hallikar type of cattle but are smaller and more compact. The bulging forehead is not so prominent as that of the Hallikar. They are very fiery and restive and difficult to train. For spirit, power of endurance and speed in trotting they are said to be unsurpassed. The chief colours are red, grey and white, red with white spots and white with red spots. The cows are very poor milkers.

Deoni.—This breed is mainly confined to the north-western and western portions of the Nizam's Dominions and appears to be allied to the Dangi cattle of Bombay Presidency.

The bullocks are good work-animals for heavy cultivation, while the cows are reported to be the best milkers in the Nizam's Dominions. In general, the Deoni resembles the Gir breed of Kathiawar to a considerable extent but there is no doubt that it has other blood in its composition and the conditions under which it is bred and reared are very different and it has developed along somewhat different lines.

Hallikar.—The Hallikar breed is mainly produced in the Tumkur, Hassan and Mysore districts of Mysore State. It represents a very definite type, varieties of which, differing in general type only slightly from each other, are found throughout Mysore territory and in certain areas of the neighbouring provinces and States.

The head and horns of these cattles are very characteristic and are quite different from those of any other type. The most striking feature is the prominent forehead, usually furrowed in the middle, with a long face tapering towards the muffle and horns which emerge near each other from the top of the poll and are carried backwards in a graceful sweep on each side of the neck and then curve slightly upwards to terminate in the sharp point which are a feature of the horns of cattle of this type. Similar horns are typical of a wide range of South Indian cattle and indicate a distinct basic type which must have existed from pre-historic times in Mysore and the surrounding territory.

Kangayam.—These cattle are bred in the south and south-east taluks of Coimbatore in Madras Presidency, where a long established herd, maintained by the Pattegar of Palayakottai, is one of the most important herds of any breed of cattle in India. These cattle conform largely to the Mysore type but there is evidence of the blood of the grey-white cattle of the north in their composition. Kangayam cattle have, however, been scientifically bred and carefully fed through many generations and are a very well fixed breed of moderate-sized but powerful draught cattle. They are exported in large numbers for work in South India and Ceylon and are strong, active work-animals, particularly economical to miantain, but the cows are generally poor milkers. They are of very good constitution and are said to last from ten to twelve years in work. In recent years this breed is being developed into a dual purpose animal for South India.

Killari.—This is a well known draught breed of the southern portion of Bombay Presidency which is bred mainly in Sholapur and Satara Districts.

It is a derivative of the Amrit Mahal but is not so compact or fine in quality or so active as the best specimens of that breed and seems to have a strain of the grey-white cattle of the north in its composition. They are very hardy cattle, able to endure scarcity of fodder, and are much appreciated for their strength and power of endurance under the plough or on the road.

Krishna Valley.—The home of these powerful cattle is the black cotton soil of the watershed of the Krishna and the rivers in the southern portions of Bombay Province and Hyderabad State. They are reared mostly by cultivators on their holdings and are to a large extent fed on specially grown fodder crops and grain crop residues.

The bullocks are very powerful animals, useful for slow draught or heavy plough in black cotton soil, and the cows are, as a rule, fair milkers, but the breed is not a well fixed one and considerable variation occurs, due to more than one basic type having entered into its composition.

The colouring and general characteristics indicate that large, grey-white cattle from the north are the basis of this breed but a careful study of individual animals reveals evidence of the blood of the Mysore basic type.

Ongole.—The cattle of the Ongole tract of the Madras Presidency are among the best known breeds of Indian cattle and are much valued for work and for milk production. They are mostly bred by cultivators in the Guntur District of Madras Presidency and when reared on the specially grown fodder and residue of grain crops produced in this fertile tract, they are exceptionally fine animals. Ongole cattle are usually docile and the bullocks are very powerful, suitable for heavy plough or cart-work but are not generally considered to be suitable for fast trotting. The cows are good milkers giving, according to a recent survey, an average yield not far short of the average of more purely milch breeds of Indian cattle for which comparable data are available.

In the past, Ongole cattle were exported to tropical America and other countries on an extensive scale, mainly for improving the local cattle by grading, and in some of these countries, herds of pure bred Ongole cattle are now maintained to provide sires for grading up the local stock of European origin. Like all Zebu cattle, their great resistance to tick borne disease and their capacity to thrive on scanty

and dry fodder, has proved of great value in building up beef breed able to thrive under tropical conditions, and cattle with a proportion of Ongole blood are now very largely bred in such countries.

Red Sindhi.—The home of this breed is the country around Karachi and north-west of it, including the Las Bela area of Baluchistan where a distinct type of considerable purity is bred.

In the cattle bred in and around Karachi it is clear that there has been a large infusion of other blood, some possibly from Afghanistan, and also of the Gir, definite evidence of which can be seen in most of the best herds.

Red Sindhi cattle are among the most efficient milch cattle of India and though comparatively small the bullocks make very useful draught animals. Owing to their small size and capacity to adapt themselves to varying conditions of soil and climate, Sindhis are now extensively used for grading up local stock in other parts of India where, owing to the poor conditions under which cattle are bred and maintained, larger animals would not be suitable.

Phandarpuri or Nagpuri Buffalo.—These are the names by which the long-horned buffaloes of Central and South India are generally known. These buffaloes are of an entirely different type from the Murrah and clearly represent a very ancient indigenous type. Buffaloes of this type are still bred in large numbers throughout Central and Southern India. They are largely used for draught but are slow movers compared with good bullocks and, like all buffaloes, should not be worked during the heat of the day.

The females are considered to be fair milkers, but cannot compare with the buffaloes bred in North and West India and Kathiawar. They are the principal milk producers of the Central Provinces and in the Nizam's Dominions and South India.

Murrah or Delhi Buffalo.—The Murrah buffaloes of the Southern Punjab and Delhi Province are typical of a wide, deep, massive milch buffaloes which, with small local variations, are bred in large numbers in the north of India, particularly in the Punjab and Sind, for milk and ghee production. The area in which they are mostly bred extends from the Northern United Provinces through South Punjab to Sind, but Murrah buffaloes have been introduced in many other parts of India to improve the local stock.

The best breeding areas for the true Murrah are Rohtak, Karnal, Gurgaon and Delhi, but high yielding strains are also bred in Sind and there are well known varieties such as the Nili or Ravi buffaloes which differ only slightly from the true Murrah. Murrah buffaloes

are at present probably the most efficient milk and butter fat producers among Indian cattle but are not suitable for draught. They are used for milk and ghee production in almost all large cities throughout India and in rural areas in the north and west.

Murrah buffaloes are very massive, stockily-built animals with deep, wide frames and short, massive limbs.

Sheep and Goats

Bellary Sheep.—This is a mixture of black and white breed. Prevailing colours are black, grey-white with black face, and a few, pure white. Rams have twisted horns while ewes are hornless, have a square body and do not fatten well. Wool is of coarse variety, average wool yield under good conditions is: for rams, 4 to 7 lbs., and for ewes, 1½ to 2 lbs. The weight of a good live ram is about 120 lbs., and that of a good ewe, 60 to 70 lbs. Mutton is of average quality.

Deccani Sheep.—These are found in Bijapur, Nagar and Sholapur. They are uniformly black in colour all over; only the joints and parts of the hind limbs are white. The fleece is loose and open more towards the front portion of the body. Wool from Belgaum, Dharwar, Sholapur and Bijapur is better than that from other parts of Maharashtra in point of length and staple.

Deccani sheep are, as a whole, smaller animals. Those from Nasik and Khandesh produce superior wool, and sheep in Nargan Petti near Sholapur is said to produce wool of a superior quality.

Hassan Sheep.—Bred on the Mysore plateau in and around Hassan and Tumkur Districts. Colour is white, and white and brown. Rams have twisted horns; ewes are hornless. The animals of this breed are slightly smaller in size than Bellary sheep. Wool yield is about 1½ lbs. Mutton is good.

Mandya Sheep.—Bred in Mysore District. Colour is brown and reddish brown—sometimes red on the head and neck only. Rams have twisted horns, and ewes are hornless—well-built and hard brutes weighing about 100 to 120 lbs. They are more hairy than woolly breeds. Mutton is very good and these sheep are largely in demand for that purpose.

Nellore Breed.—These sheep are large in size and very tall. The rams have twisted horns and weigh up to 150 lbs. live weight. Colours are white and brownish white. Some animals are black and brown. Body is densely covered with short hair. Mutton is fairly good and the Madras Market is supplied with this.

Malabar Goats.—Goat-breeding is largely carried out in the

neighbourhood of Tellicherry for supply of milk and meat. Very few pure bred goats are available. There has been promiscuous breeding resulting in a very mixed breed.

Colour is white or white and brown. The body is wedge-shaped and of a dairy type. The udders are fairly pendulous and teats are of a good size.

They are maintained mostly for milk, and sometimes for meat. Large numbers are sometimes exported to Ceylon and other outside places.

SELECTIONS

Agriculture in the Mysore State (1940–41)*

Our Agricultural Department has to its credit a good deal of research work on the evolution of improved strains of crops and the control of diseases and pests. By propaganda, combined with financial and technical assistance to the raiyats, it has endeavoured to turn the fruits of this research to practical account. The intensification of these efforts to reach the agriculturist has been a marked feature of the activities of the Department for the past few years and has been stimulated to no small extent by the valuable suggestions made by Sir John Russell and other authorities who have reported on the conditions of agriculture and livestock in India.

In 1940–41, the total number of demonstration plots reached the record figure of 4,000 and there were also 78 subvention farms and 689 seed farms. A five-year scheme for increasing the production of paddy was also introduced at a cost of Rs. 20,000 per year. The value of improved seed distributed has increased tenfold in the last four years, and in the current year the value of the seed was Rs. 1,10,000 as against Rs. 10,000 in 1936–37. All possible assistance has been given to secure an expansion of the acreage under money crops. The Mysore Tobacco Company has now developed its work so as to deal with 10,000 acres of tobacco per annum, of which nearly one half is in the Irwin Canal area. The introduction of long staple American cotton as an irrigated crop in the Irwin Canal area was attended with marked success, and the Department has arranged for the cultivation of 3,000 acres this year. Government have, at a cost of Rs. 1,80,000, sanctioned the installation of a factory near the Maddur Railway Station for ginning and pressing cotton grown in the Irwin Canal area.

The formation of agricultural colonies has been encouraged as an aid to the introduction of improved methods of agriculture and as a means of relieving unemployment among educated young men. A colony was established near Kalamuddanadoddi in the Irwin Canal area in July last year and has proved a marked success. The colony has also served the purpose of a demonstration farm and raiyats from neighbouring villages have closely watched the introduction of tobacco and irrigated cotton in this area and have now been induced to grow similar crops in their own holdings. It is proposed to start two more colonies on similar lines.

Increased attention has also been devoted to the problems of improvement of livestock, and with this object the Veterinary and Livestock Departments have been combined. There is now a District Veterinary and Livestock Officer for

* Extract from the Address of the Dewan of Mysore to the Representative Assembly on 1st October 1941.

each District, and Veterinary Inspectors at taluk headquarters have also been asked to devote a portion of their time to measures for the improvement of live-stock in selected villages in each taluk. The ranching system hitherto employed in respect of Amritmahal Cattle is now being given up and the herds are being concentrated in a few stations where special arrangements can be made for their care, feeding and supervision. Such stations have been opened at Hunsur in the Mysore District and at Devapura in Chitaldrug District, and a new station has been sanctioned this year at Lakkihalli in the Tumkur District. Including the cattle stations already established at Ajjampur and Bannur, there will be in all about 2,000 cattle from which it is hoped that an adequate supply of stud bulls and bull calves for breeding purposes will be forthcoming for the steady improvement of cattle throughout the State. With the establishment of these stations large extents of valuable land hitherto reserved for the use of Government cattle, will become available for cultivation.

Sheep husbandry is very important in the agricultural economy of Mysore and during the past few years there has been a steady advance in the measures adopted for improving the yield of wool from local sheep. A new sheep farm has been opened at Garudapalya in the Kolar District and it is hoped that from this farm it will be possible to keep up a continuous supply of cross-bred rams to sheep farms throughout the District. A scheme for the improvement of Mysore sheep inaugurated by the Imperial Council of Agricultural Research has also been begun at the Yellachihalli Sheep Farm. The policy of establishing sheep-breeders' associations is being extended so as to secure to sheep farmers higher prices for wool as a result of improved marketing. Two such associations were founded in 1940–41 at Bangalore and Chaunrayapatna, and with the older ones at Kolar, Mysore and Closepet, there are in all five such associations in the State.

Considerable progress was also made in regard to the introduction of improved breeds of poultry at various places in the State. In order to assist poultry farmers Government have sanctioned a Poultry Association for the whole State, and a beginning has been made on the marketing side with an egg marketing station at Devanhalli. Meanwhile, the research section dealing with poultry diseases has been further extended and work was commenced in the current year in accordance with the scheme drawn up by the Imperial Council of Agricultural Research.

A Fisheries Section has now been established as part of the Department of Agriculture for exploiting the fishery resources of the State with a view to increasing the food supply in the country. A sum of Rs. 13.500 has been sanctioned for equipment and for the construction of fish ponds at Thippagondana-halli and Marconahalli.

REVIEWS

Yield, Chemical Composition and Feeding Value for Milk Production of Alfalfa Hay Cut at Three Stages of Maturity, *Technical Bulletin* No. 739 of the United States Department of Agriculture, Washington, D.C.

The *Bulletin* gives the results of an investigation undertaken at the United States Department of Agriculture Dairy Field Station, Huntley, Montana, in which the comparative value of alfalfa hay, cut at three different stages of maturity, *viz.*, initial bloom, half bloom and full bloom stages of growth and fed to dairy cows as the sole ration throughout the lactation period, was studied. The investigation was conducted on two important objectives, *viz.*, (*a*) to determine the effect of cutting alfalfa at different stages of maturing on the stand of the crop, on the yield of hay and in the chemical composition, colour and leafiness of the hay; (*b*) to determine the nutritive value of hays cut at the different stages of maturity by feeding experiments and digestion trails.

The investigation covered several years and considerable variation in seasonal conditions; insect damages were also recorded. Comparative yields of hay and the cost of making it at the three stages of maturity with their feeding value were also studied. The field work of the investigation was carried out under practical dairy farming conditions on a 15-acre field of alfalfa that had a uniform stand, and had been seeded two years previously.

The feeding experiments and recording of milk yield were conducted on three groups of cows similar in their inherent milk and butter fat producing capacity and whose previous records were also uniform on mature age basis.

The chemical analyses of samples of hay were determined and digestive coefficients calculated of the samples.

Considering all phases of the experiments the authors consider that alfalfa hay cut at the initial bloom and half bloom stages or between these two stages are markedly superior in all respects to the hay cut at the full bloom stage, and recommend it as a good practice for purposes of feeding cows in milk.

—S. D. A.

Vegetable Gardening in Malaya. By J. N. Milsum and D. H. Grist. Published by the Department of Agriculture, S.S. and F.M.S., Kuala Lumpur.

The book is a practical guide to cultivation of vegetables in Malaya and embodies much scientific information of general interest regarding these crops. The authors place the knowledge of vegetable culture before the readers in accordance with the policy of self-sufficiency declaring that "in this endeavour to increase the production of vegetables, every householder can assist by using any suitable available ground for the cultivation of vegetables for home consumption" (page 206).

The Chinese market gardening described throughout the book finds a parallel in the gardening practised by *'Thigalars'* in Mysore and the choice of localities and systems of marketing also seem to have much in common.

The chapter on organised vegetable production is very interesting and the following statements are noteworthy:—"Certain Government institutions have for years past worked on the principle that at least a proportion of the vegetable requirements of the institution should be produced within its domain .... Such ventures as these should receive every encouragement and the consideration of some such scheme is suggested to Departments and commercial firms who have not to date adopted a policy in the matter." Estate gardens, cultivation allotments and school gardens are discussed.

The chapter devoted to food values of vegetables adds much to the interest of the book.

The table on page 3 indicates that the rainfall in Malaya ranges from about 74 inches to more than 200 inches annually and consequently it is a humid country. This climate corresponds to our hill stations in Mysore. The question of dryness and humidity is discussed in detail in the book in order to suggest suitable seasons for the growth of vegetables in various parts of Malaya. The following are a few observations of the authors regarding soil and climate:—"As the majority of vegetables flourish better during the dry seasons, these seasons should be kept in mind in arranging planting dates; root vegetables are generally more tolerant of the wet seasons than are other vegetables" (page 4). "In view of the successful cultivation of vegetables by Chinese market gardeners in Malaya, one hesitates to state that any drained soil is unsuitable for this purpose, and it is certain that thorough cultivation, skilful manuring and unremitting attention to watering and after-cultivation will result in satisfactory crops from most unpromising sites. The fact that Chinese cultivators are able to turn old mining land—surely the most unpromising soil— into good market gardens should convince others that it is possible to 'work up' apparently poor soils into successful vegetable beds" (page 8). "The climate in this country (Malaya), however, is not ideal for shallots and onions, as it is too moist, whereas the dry climate of India and Egypt favour the development of well matured bulbs, the damp atmosphere of this country encourages continuous growth thus preventing the formation of good bulbs" (page 205).

With such reservations there is much in common between the vegetables grown in India and Malaya.

M. V.

IN MEMORIAM

Mr. M. S. Ramachandra Rao, B.A., B.L., was long associated with the activities of our Union, and latterly, served on the Managing Committee. In him we have lost from our midst, an enthusiastic and lively personality.

List of Publications with Important Contents received at The Mysore Agricultural and Experimental Union, Bangalore

April–June 1941

A list of Bulletins and Journals received by the Union during the last quarter of the year ending 30th June 1941, is published, along with important contents for the information of the members.

If any member so desires, the Secretary will be glad to send a summary of any Bulletin or an article in any Journal received by the Union. The member may kindly mention the name and number in the case of Bulletins, and the subject and the Journal and the number in brackets in the case of an article.

Publications may be borrowed by members from the library of the Union, subject to rules framed in this behalf.

1. *New Zealand Journal of Agriculture,* Vol. 62, No. 3, March 15, 1941—

Possibilities of Farm Production—A survey of some of the major farming resources of New Zealand. *By R. P. Connell* .. (25)
Seed Mixtures for Permanent Pastures. *By A. M. Lee* .. (40)
Concrete on the Farm. *By J. A. S. Miller* .. .. (20)
Copra as a Pig Feed .. .. .. (55, 35)
'Staggers' in Animals. *By J. Mullins* .. .. .. (30)
Potash Supplies in War-time—Alternative Sources .. .. (11)
All the Year Round Fattening Pigs—Value of Sugar Beet as bulk supply feed for the winter .. .. .. (35)
Rotational Grazing for Winter Feed .. .. .. (30)
How to distinguish between the Grass Grab and the Subterranean Grass Caterpillar—*Odontria zealandica* and *Oxyancus cervinata. By L. J. Dembleton* .. .. .. (17)
Short Notes on Worms in Calves, Foul of the Foot, Sores on Cow's Teats, Lameness in a Sow. Overy Trouble in a Cow, Bad Cough in Pigs, Pink Eye in Sheep, Controlling of Re-seeding of Sub-clover, Sowing White Mustard, Frost on Marygolds, Waterproofing Jute Cow-covers, 'It pays to house implements', An Effective Rigid Wire Gate, Importance of Observing Trees, Making Cider, Shed Storage of Fruits, Growing Spring Cabbage, Maintaining Soil Fertility in Vegetable Gardens, Autumn Apiary and Honey House, Meeting the shortage of Pollard and Bran for Poultry, Erection of new Poultry Plants, Prevention and Treatment of Tetanus or Lock-jaw, etc.
(30, 35, 33, 40, 39, 34, 32, 1)

2. *The Journal of the Department of Agriculture, Victoria,* Vol. 39, Part 3, March 1941—

Eye Cancer in Cattle .. .. (30)
Mange or Scabis of Pigs. *By E. Murray Puller* .. .. (35)

Potato Manurial Trials—Results for 1939-40.
By G. H. Mattingley .. .. (47)
Judging Corriedale Sheep, a Dual Purpose Breed.
By N. A. Bowman .. .. (33)
Insect Pests of Cabbages, Cauliflowers and Related Plants.
By R. T. M. Pescott .. .. (39)
'Bearing Trouble' in Ewes. *By A. R. Grayson* .. .. (30)
Leaf Variegation of the Apple. *By C. E. Cole* .. .. (39)
Infectious Laryngotracheitis, a Disease of Poultry.
By Harold E. Albiston .. .. (32)
Neutralization of Sour Cream for Butter Making—I. Estimation of Cream. *By F. S. J. Newman* .. .. .. (29)
Vol. 39, Part 4, April 1941—
Pasture Improvement, Hints on Seeding and Choice of Species.
By L. C. Bartles .. .. (40)
Quality of Butter—Warning to Factory Managers .. .. (27)
Manuring Irrigated Pastures .. .. .. (40)
Lucern for non-Irrigation Areas in the Wheat Belt.
By L. C. Bartles .. .. (40)
Managing the Lucern Stand—Results at Boort. *By A. Morgan* (40)
Wheat Varieties in the Mallee. *By W. B. Miller* .. .. (43)
Tapeworms in Poultry .. .. (32)
Victorian F.A.Q. Wheat—Analysis of 1941 Sample.
By J. E. O'Brien .. .. (43)
Poultry Farming .. .. (32)
Reclaiming Beeswax—Apiary Methods. *By J. S. Eagland* .. (34)

3. *The South African Sugar Journal,* Vol. 25, No. 2, Fabruary 1941—

Sugar and the War .. .. (25)
The World Sugar Outlook .. .. .. (25)
Sugarcane Varieties in Mauritius—An Historical Review, with Particular Reference to Present Breeding Problems.
By G. C. Stevenson .. .. (49)
The Problem of Sugar Storage .. .. .. (49)
Agricultural Lime. *By N. L. Galvez* .. .. .. (12)
The Role of Organic Matter. *By Dr. J. Fisher* .. .. (11)
Vol. 25, No. 3, March 1941—
A Method of Sampling and Testing Cane. *By R. H. Littell* .. (49)
Sugarcane Varieties in Mauritius. *By G. C. Stevenson* .. (49)
War and Nitrogen Sufficiency. *By J. E. Zanetti* .. .. (25)
Sheep Kraal Manure. By A. J. Taylor .. .. .. (33)
Relationship between Hardiness of Sugarcane and Varietal Resistance to the Beetle Borer (*Rhabdœnemis obsema,* Boisd.) .. (49)
The Value of the Papaw. *By P. D. J. Hofmeyr* .. .. (39)
Vol. 25, No. 4, April 1941—
Organic Manures, Composts and Artificial Fertilizers.
By G. Ingham .. .. (11)

4. *The Malayan Agricultural Journal,* Vol. 29, No. 3, March 1941—

Seasonal Loss of Condition in Rhode Island Red and Other Fowls in Malaya. *By G. E. Mann* .. .. .. (32)
The Value of Fish Refuse as a Food for Pigs. *By C. W. S. Hartley* .. .. (35)
A Note on the Distribution of Vitamin B_1 (*Thiamine*) in the Rice Grain. *By R. A. A.* .. .. (14, 46)
Increased Food Production in Malaya .. .. .. (1)
School Gardening .. .. (1)
Synthetic Rubber .. .. (53)
Vol. 29, No. 4, April 1941—
Results of a Manurial Experiment on Cocoanuts. *By R. G. H. Wilshaw* .. .. (55)
Branch Canker of Tea. *By A. Thompson* .. .. (53)
Rice in Malaya. *By D. H. Grist* .. .. .. (46)
The Export Crops of the Netherlands Indies in 1939—An Abstract (25)
Vol. 29, No. 5, May 1941—
The Malayan Tea Industry. *By D. H. Grist* .. .. (53)
A Comparison between Natural Covers and Clean-Weeding on Yields of Oil Palms. *By A. B. Lucy* .. .. (55)
Papaya (*Carica papaya*) .. .. (39)
Conditions on Rubber Small Holdings in Malaya .. .. (53)
Storage of Vegetable Seeds .. .. (39)

5. *The Implement and Machinery Review,* Vol. 66, No. 790, February 1941—

New Ideas in Farm Grinding .. .. .. (20)
Is the New Method of Grinding Generally Practicable? .. (20)
Are there Justifiable Fears for the Future of the Implement Trade? (24)
Post-War Implement Distribution .. .. .. (25)
Is a New Tractor Size Needed? .. .. .. (20)
How the Small Tractor could be Worked .. .. (20)
Future Developments in Power-Farming Machinery. *By Walter L. Hill* .. .. (20)
New Technique of Farm Grinding .. .. .. (20)
The New 'Robot' Transplanter .. .. .. (20)
Dressing Cereal Seed .. .. (7)
Thatch-making Machine .. .. (20)
Dairy Equipment—An Examination of Electrical Operation .. (27)
Vol. 66, No. 792, April 1941—
Why there are Unavoidable Delays in Implement Supplies .. (25)
Importance of Spares .. .. (20)
Why Farming To-day is Different .. .. .. (6)
A Power Unit Which Defies Time .. .. .. (20)
Potato Cultivation with Standard Tractors .. .. (47)
Dairy Equipment—Modern Fittings—How Europe's Largest Cowhouse is Equipped—Increased Economy and Hygiene .. (27)

6. *The Review of Applied Entomology,* Series B, Medical and Veterinary, Vol. 29, Part 3, March 1941 (1, 16, 17, 18, 19)

7. *Crop Reports, China,* Vol. 7, Nos. 1, 2, 3, 4, 5 and 6, June 1939 .. (1)

8. *The Philippine Agriculturist,* Vol. 30, No. 1, June 1941—

The Poultry Industry of Australia. *By F. M. Fronda* .. (32)

Effects of Varying Amounts of Ammonium Sulphate upon Yield, Rate of Maturity and Size of Grain of Rice Grown on Lipa Clay Loam .. .. (46)

Yield of Para Rubber Seedling Trees in the American Rubber Plantation Company at Latuan, Isabela, Basilon Island. *By Pedro A. David* .. .. (53)

A Study on the Weeds infesting Pastures and the Cost of removing them by Grubbing. *By J. Juniga* .. .. (8)

9. *The Journal of the Jamaica Agricultural Society,* Vol. 44, No. 12, December 1940—

Nutrition and Agriculture. *By H. H. Croucher* .. (1, 22)

More and Better Corn-Cultivation. *By L. Densham* .. (42)

Seasonal Hints on Livestock. *By J. W. Howe* .. .. (30)

Banana Leaf Spot Investigations—The Basis of Control. *By R. Leach* .. .. (39)

Effect of Shade on Banana Leaf Spot .. .. .. (39)

Pineapple Caterpillar .. .. (39)

Composition of Hen's Egg .. .. (32)

Molasses as a Fertilizer .. .. .. (11, 49)

Vol. 45, Nos. 1 and 2, January and February 1941—

A Pension from the Soil. *By G. R. Graham* .. .. (23)

Bananas as a Fertilizer .. .. (39)

Vol. 45, No. 3, March 1941—

Selection of Seed Corn .. .. (42)

Some Points to Consider in Dairy Farming. *By J. W. Howe* .. (27)

Concerning Bees. *By P. O. Molland* .. .. .. (34)

Poultry Production: No. 1.—Hatching—Selection of Eggs—Selection of Hens—Making the Nest—After-care—Time of Sitting .. .. (32)

Isolation Pen for Sick Pigs .. .. (35)

Banana Leaf Spot Investigations. *By R. Leach* .. .. (39)

Do Your Eggs Get Dirty? .. .. (32)

10. *Bulletin of the Pan-American Union,* February 1941—

Dominion Republic—Increase in Agricultural Production El-salvador—

The Cotton Situation in Paraguay—Agriculture a Fundamental Problem—Latin-America as a Source of Strategic Materials .. (25)

May 1941—

A Practical Method of Smoothing Statistical Curves by Hand. *By Carlos Garcia Mata* .. .. .. (1, 2)

The United States Market for Argentine Exports—Pan-American Food Fiesta in New York .. .. (25)

11. *Experiment Station Record, U.S.D.A., Washington,* Vol. 84, No. 4, April 1941—

Vol. 84, No. 5, May 1941 .. .. .. (1)

12. *United States Department of Agriculture,* Washington—
Technical Bulletins—

Technical Bulletins Nos. 701–725 with Contents .. .. (1)
Comparative Studies of Varietal Suitability for Freezing Preservation of Peas, Green or Saup Beans, Lima Beans and Sweet Corn grown under Eastern Conditions, *Tech. Bul.* 731 .. (48)
Anatomical Structure of the Cotton-seed Coat as related to Problem of Germination, *Tech. Bul.* 734 .. .. (41)
Yields of Barley Varieties in the United States and Canada, *Tech. Bul.* 735 .. .. (45)
Windrowing and Storing of Sugarcane in Lousiana, following Injury by Freezing Temperatures, *Tech. Bul.* 736 .. (49)
Experiments with *Trichogramma minutum* Riley as a Control of the Sugarcane Borer in Lousiana, *Tech. Bul.* 743 .. (49)
Grain Prices and the Future Market—A 15-year Survey, 1923–38, *Tech. Bul.* 747 .. .. .. (24)
Comparison of American Gum Turpentine exclusive of the Pinenes, *Tech. Bul.* 749 .. .. (13)
Supply Responses in Milk Production in Dodge and Barron Counties, Wis., *Tech. Bul.* 750 .. .. (27)
Trends in Dairying by Major Type of Farming Regions, *Tech Bul.* 751 .. .. (27)
Rock Weathering and Soil Profile Development in the Hawaiian Islands, *Tech. Bul.* 752 .. .. (11)
Cotton-Price Relationships and Outlets for American Cotton, *Tech. Bul.* 755 .. .. (41)
The Corrosive Effect of Chlorine and Lye Solution on Metals used in Dairy Equipment, *Tech. Bul.* 756 .. .. (27)
Parasites of the Birch Leaf-mining Sawfly (*Phyllotoma nemorata*), *Tech. Bul.* 757 .. .. (16)
Selenium Occurrence in Certain Soils in the United States, with a Discussion of Related Topics, *Tech. Bul.* 758 .. .. (11)
Residual Effects of Fœcing and Hardening of Tomato, Cabbage and Cauliflower Plants, *Tech. Bull.* 760 .. .. (39)
Seasonal Distribution of Rainfall in Relation to Yield of Winter Wheat, *Tech. Bul.* 761 .. .. (43)
Structure and Development of the Alimentary Canal of the Southern Armyworm Larva, *Tech. Bul.* 762 .. .. (16)
Restoring Conifers to Aspen Lands in the Lake States, *Tech. Bul.* 763 .. .. (44)

Trends in Production and Foreign Trade for Meats and Livestock in the United States, *Tech. Bul.* 764 .. .. (29)
Inheritance in rice of reaction to *Helminthosporium oryzæ* and *Cercospora oryzæ*, *Tech. Bul.* 772 .. .. .. (46)
A Physiological Study of Carotenoid Pigments and Other Constituents in the Juice of Florida Oranges, *Tech. Bul.* 780 (39)

Farmers' Bulletins—
Farmers' Bulletins Nos. 1826–1850 with Contents .. .. (1)
The Making and Feeding of Silage, F.B. 578 .. .. (28)
Raspberry Culture, F.B. 887 .. .. .. (39)
Strawberry Culture, F.B. 1028 .. .. .. (39)
Judging Beef Cattle, F.B. 1068 .. .. .. (30)
Forestry and Farm Income, F.B. 1117 .. .. .. (44)
Ginseng Culture, F.B. 1184 .. .. (47)
Sheep-killing Dogs, F.B. 1268 .. .. .. (33)
The Home Fruit Garden on the Northern Great Plains, F.B. 1522 (39)
Protection of Log Cabins, Rustic Work and Unseasoned Wood from Injurious Insects, F.B. 1582 .. .. (16, 21)
Frost and the Prevention of Frost Damage, F.B. 1588 (2, 15)
Irrigation Practices in Growing Alfalfa, F.B. 1630 .. (40)
Short Leaf Pine, F.B. 1671 .. .. (44)
Diseases of Rice, F.B. 1854 .. .. (46)
Culture, Diseases and Pests of the Box Tree, F.B. 1855 .. (44)
The Japanese Beetle and Its Control, F.B. 1856 .. .. (16)
Insect Pests of the Peach in the Eastern States, F.B. 1861 .. (39)
Vegetable Seed Treatments, F.B. 1862 .. .. .. (7)
The Turnip Aphid in the Southern States and Methods for Its Control, F.B. 1863 .. .. (47)
Toward Soil Scrutiny on the Northern Great Plains, F.B. 1864 (11)
Wireworm and Their Control on Irrigated Lands, F.B. 1866 .. (16)
Brucellosis of Cattle (Bang's Disease infectious abortion), F.B. 1871 .. .. (30)
Sugar Beet Culture, F.B. 1867 .. .. .. (50)
Wild Life Management through Soil Conservation on Farms in the North-West, F.B. 1869 .. .. .. (37)
Foundations for Farm Buildings, F.B. 1869 .. .. (20)
Slip Covers for Furniture, F.B. 1873 .. .. .. (21)

Leaflets, Circulars, etc.—
Blueberries, Leaflet 201 .. .. (39)
Culture of Orchids, Leaflet 206 .. .. .. (39)
Controlling Tape Worms in Poultry .. .. .. (32)
Intensive Profits under the Co-operative Farm Forestry Act, Leaflet 208 .. .. (44)
Gas Treatment for the Control of Blue Mold Disease of Tobacco, Leaflet 209 .. .. (56)
Leaflets 151–200 with Contents .. .. .. (1)
Effective Extension Circular Letters, Miscellaneous Publication 403 (1)

13. *Dominion of Canada, Department of Agriculture—*

Prices and Returns for Nova Scotia Apples. *By A. E. Richards.* Publication No. 707, November 1940 .. .. .. (39)
Eradication of Leafy Spurge (*Euphorbia esula*), Publication No. 710, November 1940 .. .. .. (8)
Report of the Minister of Agriculture for the Dominion of Canada for the Year ended March 31, 1940 .. .. .. (1)

14. *Oklahoma Agricultural and Experiment Station,* Still Water—

Current Farm Economics, Oklahama, Series 49; Vol. 14, No. 1, February 1941 .. .. (25)

15. *Agricultural and Experimental Station, Burlington, Vermont—*

Effect of the Lime on the Nitrogen Content of Cow Manure. *By A. R. Midgley and W. O. Mueller.* Bulletin No. 456, April 1940 .. .. (11)
The Relation of Bacteria and of Oxygen to the Flavor of Milk Susceptible to becoming oxidised. *By J. G. Leeder and E. O. Herried.* Bul. No. 457, April 1940 .. .. (29)
Commercial Feeding Stuffs. *By L. S. Walker and E. F. Boyer.* Bul. 458, April 1940 .. .. (30)
The Conservation of Alfalfa, Timothy and Soyabeen Nutrients as Silages and as Hays. *By J. A. Newlander, H. B. Ellenberger, O. M. Camburn and C. H. Jones.* Bul. 459, June 1940 .. (28)
The Cause and Nature of Overliming Injury. *By A. R. Midgley and D. E. Dunklee.* Bul. 460 .. .. .. (11)
The Dissolved Gases in Milk and Dye Reduction. *By J. M. Frayer. Bul.* 461 .. .. .. (29)
Cost of Transporting Milk and Cream to Boston. *By L. T. Souley.* Bul. 462 .. .. .. (29)
Fifty-third Annual Report, 1939–40. *By J. H. Hills.* Bul. 463 (1)
Commercial Fertilizers, Pastures and Plant Food. *By L. S. Walker, E. F. Boyce and H. J. Cannon,* Bul. 464 .. (11)
Agricultural Seed. *By Anna S. Lutman.* Bul. 466 .. .. (7)
Price Variations among Retail Grocery Stores of Burlington. *By Dorothy D. Nuetzman and Marianne Muse.* Bul. 467 (21, 24)
Bitter Pit for Apple. *By M. B. Cummings and R. G. Dunning.* Bul. 467 .. .. (39)
Commercial Feeding Stuffs. *By L. S. Walker, E. F. Boyce and H. J. Cannon.* Bul. 468 .. .. (30)
Housing of 299 Vermount Village Families. *By Virginia Britton.* Bul. 469 .. .. (23)

16. *University of California Publications in Agricultural Sciences—*

Vol. V, 1924–31, Index .. .. (1)
Vol. VI, 1930–39, Index .. .. (1)

17. *Georgia Experiment Station, Georgia—*

Culture and Fertilizer Studies with Peanuts. *By W. R. Gore.* Bul. 209, February 1941 .. .. (48)
Graphic Summary of Farm Tenancy in Georgia. *By J. C. Florid.* Bul. 210 .. .. (23)
Corn Varieties, Hybrids, and Cultural Practices, Circular 126 .. (42)
Sugarcane for Sirup Production, Circular 284 .. .. (49)
Making and Using Peanut Butter, Circular 384 .. .. (48)
Dry Land Crops at the Dalhart (Texas) Field Station, Circular 564 (6)
The Relation of Firmness to Ripeness of Eastern Grown Apples, Circular 579 .. .. (39)
Studies on the 'Raisining' of Alexandria (Muscat) Grapes in Transit, Circular 574 .. .. (39)
Harvesting Pyrethrum, Circular 581 .. .. (17, 39)
Eggs and Egg Products, Circular 583 .. .. .. (32)
Development of Interspecific Tomato Hybrids of Horticultural Value and Highly Resistant to Fusarium Wilt, Circular 584 .. (39)
Slash Disposal and Forest Management after Clear Cutting in the Douglas—Fir Region, Circular 586 .. .. (44)
Temperatures of Wheat in Experimental Farm Type Storages, Circular 587 .. .. (43)
The Atlantic Pemberton, and Burlington Blueberries, Circular 589 (39)
Influence of Altitude and Aspect of Daily Variations in factors of Forest-fire Danger, Circular 591 .. .. (3, 43)
Machinery for Growing Corn, Circular 592 .. .. (42)
Apparatus and Technique for the Study of the Egg Parasites of the Beet Leaf Hopper, Circular 593 .. .. .. (50)
The Use of Traps against the Japanese Beetle, Circular 594 .. (16)
The Growth and Composition of the Fruit of Okra in relation to Its Eating Quality, Circular 595 .. .. .. (39)
The Imperial Strains of Lettuce, Circular 597 .. .. (39)
Experiments in the Use of Vapour Spray Equipment, Circular 598 (15)
Estimating the Quantity of Settled Corn Silage in a Silo, Circular 603 .. .. (28)

18. *Virginia Truck Experiment Station—*

Truck Crop Investigations—Vegetable Crops Affected by Boron Deficiency in Eastern Virginia. *By E.R. Parvis and W. J. Hanna* .. .. (39)

19. *Cornell University Agricultural Experiment Station,* Ithaca, New York—

Use of Time in Its Relation to Home Management. *By Jean Warren,* Bul. 734 .. .. .. (21)
Selective Factors in Migration from a New York Rural Community, Bul. 736 .. .. (23)
Some Facts concerning Country Fruit and Vegetable Auctions in Eastern Seaboard States, Bul. 737 .. .. .. (39)

Biology and Control of the Wheat Wire Worm (*Agriotes mancus* Say.), Bul. 738 .. .. (42)
Uninfected Elm Wood as a Source of the Bark Beetle (*Scolytus multistraitus* Marsham), Carrying the Dutch Elm Disease Pathogen, Bul. 740 .. .. .. (16, 44)
The Business of Milk Retailing by Producer Distributors in New York State, Bul. 741 .. .. (29)
The Yellow Disease of Lettuce and Endive, Bul. 742 .. (39)
Marketing New York Livestock, Bul. 744 .. .. (29)
Effects of Mineral Nutrient Deficiencies and Excesses upon the Vegetative Growth and Flowering or Sweet Peas, Bul. 745 (39, 48)
Soil and Field-Crop Management for South Eastern New York, Bul. 746 .. .. (6)

(*To Continue*)

1587-51 Printed at The Bangalore Press, Bangalore City, by G. Srinivasa Rao, Superintendent

Farmers in Mysore!

Have You an Agricultural Association in Your Locality?

If not, why not form one?

The advantages are many:

You can

(1) develop Agriculture on modern lines;
(2) make a profitable business out of Agriculture;
(3) try the Departmental methods and suggestions, co-operatively or individually;
(4) get improved seeds, fertilizers, and implements for your trials;
(5) make use of the Agricultural Library at the Head Office at Bangalore;
(6) educate the masses, in turn, to "Better Farming" practices;
(7) represent your problems and difficulties to the Agricultural Department and demand solutions.

After forming one, Affiliate it to the premier Agricultural Institution in Mysore

The Mysore Agricultural and Experimental Union.

For affiliation and membership apply for a copy of the Constitution and Rules to :

The Secretary

THE MYSORE AGRICULTURAL AND EXPERIMENTAL UNION
Seshadri Road, BANGALORE